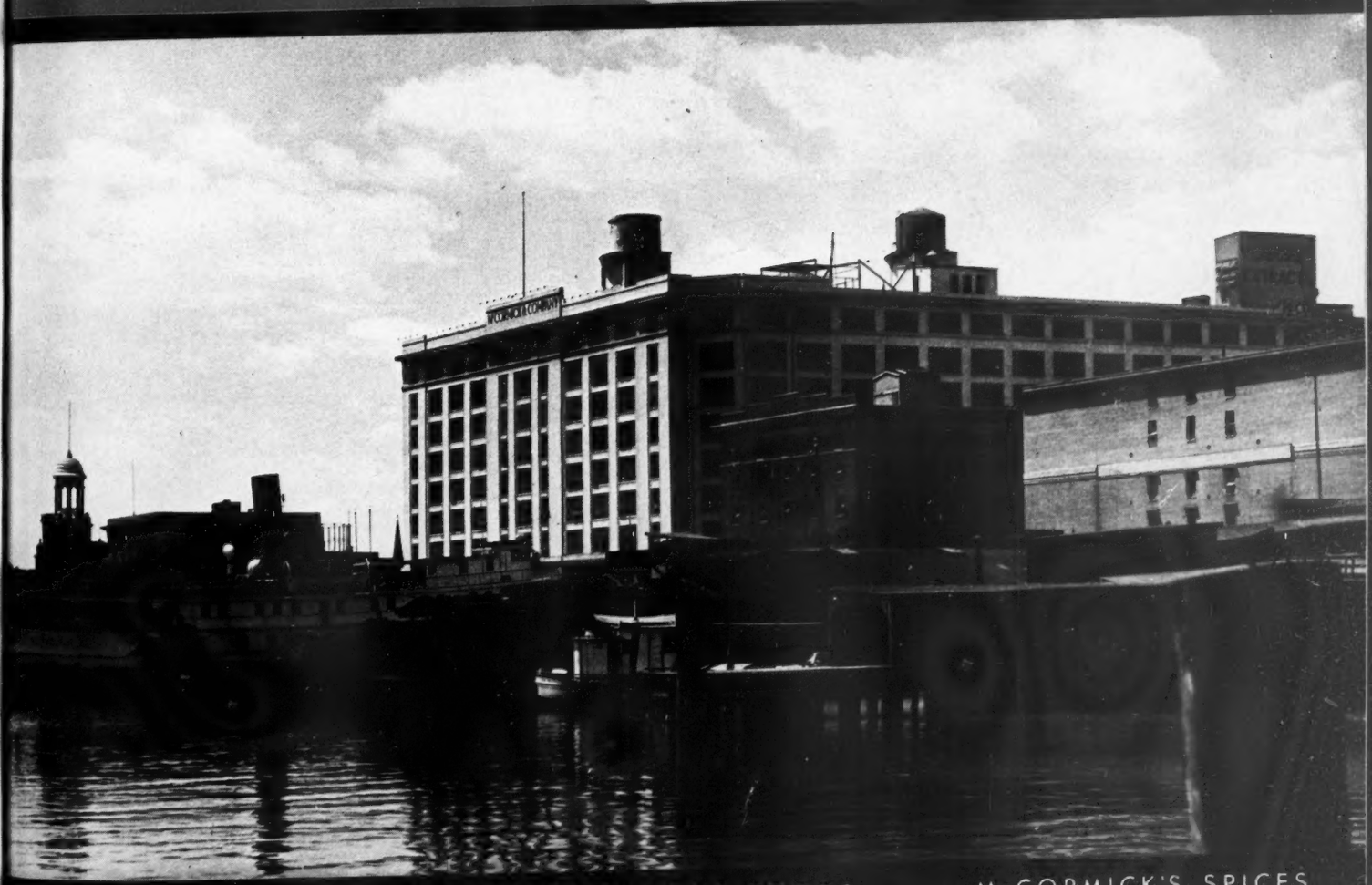
FOOD INDUSTRIES

SEPTEMBER 1938



HOMES OF FAMOUS FOODS . . . . . McCORMICK'S SPICES

IN THIS ISSUE: Cabinets For Frozen Foods; Bottled Milk Distribution

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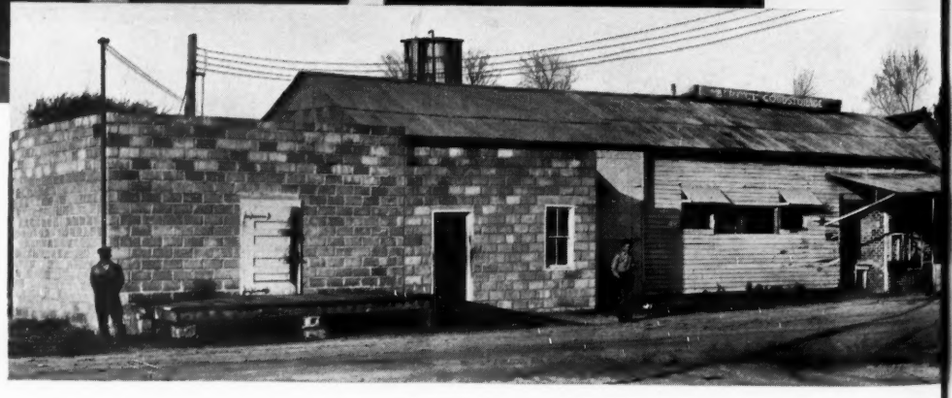
ON THE JOB

NIGHT AND DAY



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FOOD INDUSTRIES

DISTRIBUTION PROCESSING

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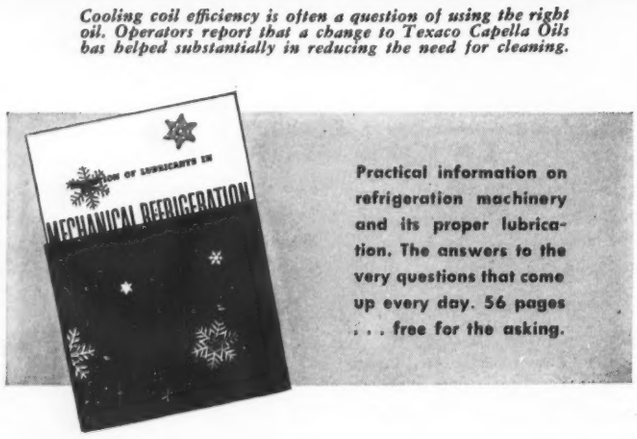

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FOOD INDUSTRIES

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Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 10, No. 9

Laurence V. Burton, Editor

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SEPTEMBER 1938

The Talk of the Industry

» No, MR. TINKELBURY, that table of spices and their uses on page 423 of August, FOOD INDUSTRIES is not upside down. You are supposed to walk around to the right hand side of your copy when you read it.

» SPEAKING OF EGGS, did you ever hear of "Viking Eggs"? From the name one might think they were of Norseland origin and in some way related to caviar.

Alas, for the German baker, noodle maker, and egg epicure, it is merely a

cheap fish extract that *Der Fuhrer* decrees shall be used as a substitute for eggs. One pound of extract from 32 lb. of fish is declared to be equivalent to 160 hens' eggs.

Since German hens lay only about half of the 800,000,000 eggs used annually in the German baking and noodle industries alone, something had to be done about the other half if German money is to be kept at home. Cheap fish extract is the answer by a Hitler decree.

» No EVENT in the near future causes so much animated anticipation, as the coming legal battle between Booth Fisheries and General Foods. The test is to determine patent priority in the case of the Birdseye system of quick freezing.

One cannot suppress a hunch that, should Booth win, no royalties would be paid. Rather one suspects that Booth would become a part of General Foods—for a slight consideration, of course!

» THAT CURIOUS DEVICE under our name on the contents page which looks like a pile of books surmounted by a cash register is supposed to be a picture of the McGraw-Hill Building which houses the 24 McGraw-Hill magazines, the McGraw-Hill Book Company and quite a number of tenants. FOOD INDUSTRIES is on the 24th floor.

» APPARENTLY the unusual provisions to get salmon up and down over the huge Bonneville dam in the Columbia River are proving to be successful. But let no man ridicule the anxiety, the mechanical elevators, or any other gadgets and devices that were created to cope with a wholly unprecedented problem. Had they failed, a huge food industry would have been wiped out.

» MANY THINGS in this life are desirable but can be purchased only from our individual savings. For instance, houses. Those who complain of unwillingness of people to build homes should keep an eye on the costs. For the cost must be kept within the ability of the individual to save; or else, no sale.

» So DR. ARTHUR E. MORGAN, late of T.V.A., disapproves of spending a little money to develop an improved method of freezing strawberries, as he testified before the investigating commission? When one considers the millions upon millions of tax-payers' dollars that are tossed about, this plaint about waste seems a bit absurd.

» WORD NOW COMES from Washington expressing the belief that the present intention to keep the monopoly investigation on an objective basis is expected to degenerate into systematic persecution of business. But, since Dr. Thurman Arnold, assistant attorney general, has jumped on the medical profession for alleged monopolistic practices, he has adopted a course of action that can be used with equal logic against the monopolistic practices of the leaders of organized labor.

Give the boy more rope!

» A MILK BOTTLE can be expected to average survival of 35 round trips, says the report of an investigation by

the Bureau of Dairy Industry. Some bottle manufacturer ought to make a lot of money if he could guarantee the average.

» SPEAKING OF COFFEE, a man who has the whole say-so about a rather obscure brand that sells at the rate of 20,000 lb. a day insisted that we try it. To his way of thinking it was the best possible blend and he vigorously resists all suggestions that it is not perfect. One sip of it is enough to convince any coffee lover that His Nobs, the general manager, does not know what good coffee tastes like and that he is catering to a public that is satisfied with funny tasting colored,

hot water. Which does not seem like a very sound basis on which to build an enduring business. Suppose his public should acquire a taste for good coffee? A long laborious story about perfect quality control is no substitute for real good flavor. We are strong for quality-control but the quality is more essential than control.

How Soil Erosion Control Affects the Food Industries

FOR THE BENEFIT of those who are interested in long time trends, it should be noted that North Carolina has been producing increasing amounts of hay. In 1936 that state produced 680,000 tons and in 1937 the amount was 824,000 tons. Our own unofficial guess is that 1938 production will be about 1,000,000 tons. Lespedeza production is increasing very rapidly.

What has caused the increase and what has it to do with food manufacture?

North Carolina produced more hay than it could consume in 1937 as a *direct result* of soil erosion control. By planting cover and forage crops to prevent hillsides from washing away a new problem is created—a superabundance of animal feed.

It does not take much imagination to foresee that farmers will raise animals to consume the surplus feed (the excess cannot be economically sold or shipped) and that in turn will ultimately mean more milk production and more live stock for slaughter.

Far sighted management will note the trend as evidenced by North Carolina statistics and be prepared with long time programs. For it is evident that erosion control is to be practiced "from now on."

Cured Meat Exports

WHAT THE PENDING reciprocal trade agreement between United States and United Kingdom may bring forth is, at the time of writing, still a matter of conjecture. In early summer our share of British imports of cured meats was only 8 per cent of the total of about 132 million pounds. Poland shared almost equally well; whereas, little Holland's share was 9.5 per cent; and Sweden sold better than 4.5 per cent. Denmark, however, got the lion's share of the business, namely 63.5 per cent.

If the U. S. quota is increased, the American meat packer and hog raiser will be pleased, but it is inevitable that there will be compensating losses.

Official Food Standards

STANDARDS OF QUALITY and of identity will be established by the Food and Drug Administration under its new law, as described elsewhere in this issue. When these standards are so fixed by the prescribed procedure, they will have the same force as if they had been written into the law by Congress itself. They will no longer be merely *guides* to administrative action.

This is a very fortunate thing. It means that the food industries will be able, as standards are developed and announced, to determine just exactly what requirements they must meet with respect to any commodity which they propose to market under any given commodity or quality name. Because of this fact it is increasingly important that the standards be determined and phrased with great care. Exactness of phraseology takes on far more significance than formerly.

Food and Drug Administration is organizing a new advisory committee which will serve it officially in the formulation of standards. It is hoped, and expected, that a distinguished board will be formed which is judicially minded, as well as technically well-informed. The industries await with great interest the naming and the announcement of the personnel. It is to be hoped that the very best men in the country will be chosen and that they will be willing to serve.

A Neglected Aspect of Distribution

MANY CONCERNS in the food business operate large fleets of trucks and salesmen's cars which have a capital investment that often exceeds the company's investment in warehouses or inventories. Such a condition is one that merits the wholehearted attention of the executives who control the purse strings. Yet, in spite of what would seem to be a very evident fact, the condition exists in many companies where top management fails to act favorably upon recommendations for the most effective and economical operation of this huge investment. This is par-

Hors d'Oeuvres

• To a certain extent, sugar will stop the corrosion of iron, the English Food Investigation Report says. Maybe the confectionery industry will turn to the manufacture of candy-coated plumbing.

• *During 1929-35, per capita consumption of evaporated milk increased 31 per cent in the United States. Apparently condensed milk goes well with condensed incomes.*

• The German floating factory, "Walter Rau," is reported to have successfully canned whale meat. Perhaps a hermetically sealed tin can is as good a place as any to put whale meat, so long as you leave it there.

• *Before us is a dog-food label with so much eye appeal that it almost makes your mouth water, and the product is tested and approved by Aa Ha—sorry, AAHA (American Animal Hospital Association). But hold everything, small type in one corner of the label says something about horse meat. It turns out that this meat is federally inspected, but we'll still let the dogs have it.*

• Mobile milk bars have been the rage with John Bull this summer. There have been some 1,100 of these roaming the English countryside, visiting villages, seaside resorts and what have you. These moo-juice wagons are equipped to serve hundreds of people, and they cost about $15,000. Just think, people used to get milk from cows.

• *Household Hints:—Rats are a welcome change of diet from the regular food served in Arctic regions, say Dr. Kane, Rear Admiral Beaufort, Captain Inglefield and other Arctic explorers. Hardy, with others, is said to have eaten roasted rats and rats that have been fricasseed. The roasted rat is prepared by wrapping half a rat in bacon and then slowly toasting it. It is said to be better than rabbit meat, and it looks something like squirrel. Pass the pork chops, please.*

• Exports of canned pineapple and pineapple juice from Hawaii amount to $54,000,000 annually. It would seem that the economic life of Hawaii hangs by a pineapple stem, just as the social life hangs by a blade of grass.

• *At the Berlin Institute for Biological and Chemical Research, tests indicate that the "harder" the water used in brewing coffee the worse the taste of the beverage. It was also found that water containing a small amount of gypsum made the coffee thin and watery, indigestible and highly unsatisfactory in taste. So it seems that impurities in water have the same effect on coffee as the mythical pair of well-worn socks.*

• Imports of food from Japan have slumped badly. Imports of silk have held up well. Which shows that women, who buy both the food and the silk, would rather exert sex appeal than eat.

ticularly true of the matter of proper fuels, lubricants and preventive maintenance, especially the latter.

A very considerable part of the responsibility for such omissions is unquestionably traceable to executive unfamiliarity with the possible economies that may be obtained, and the tendency to say "No" to a proposal which is not thoroughly understood. Another source of responsibility for such omissions is the occasional hard-boiled purchasing manager who also may be unfamiliar with technical matters as well as resentful of any interference with his judgment as to what is the best buy.

To correct these errors requires that the responsible executives must familiarize themselves with the *possibilities* of economy that are inherent in their own fleet operations—not *how* to conduct routine tests and the like—so that the automatic "No" of a high powered executive may be eliminated in favor of a well considered appraisal. In such an appraisal, a background of knowledge of technical possibilities is indispensable. And twenty years of experience in driving passenger cars, though helpful, is not the complete basis for sound judgment. Passenger cars are driven for pleasure, comfort and convenience, not because they are the most economical form of transportation. Trucks, on the other hand, are operated chiefly from the economy viewpoint. And hence the executive decision on truck operation must be based on other conditions than those which obtain in private passenger car operation.

Board of Health Price Fixing

INTERESTING CHARGES are being made in the current Federal Grand Jury investigation of milk prices in and about Chicago. It seems that the Chicago Board of Health has been occupying a key position in a price maintenance program.

By keeping thumbs down on all containers except glass bottles, the Board is charged with eliminating competition based on possible differences in container costs.

More significant is the charge that, in periods of abundant milk supply, the number of dairies given inspection service is reduced supposedly to those with a combined production output sufficient to supply the needs of the city. This practice is said to prevent an oversupply of milk from depressing market milk prices in the city. In periods of milk scarcity, it is alleged, greater liberality is shown in granting inspection service. Such liberality permits previously excluded dairies to sell milk in the city and to keep prices to the consumer from rising above a predetermined level.

If such a system can be made to work with milk, as effectively as accusers of the Board say it has, how long will it be before someone will want to substitute Board of Health rulings for price maintenance legislation?

Time for Action

THE CURRENT BATTLE and name-calling contest between A.F. of L. and C.I.O. has long passed the amusing stage.

It has even passed the stage where it is a public spectacle in which outsiders unwisely imagine they have but little interest. Such a view was recently privately expressed to us by a prominent (New Deal) U.S. Senator. Said he, "The top jobs in labor organizations are very lucrative. Their pay is usually far better than that of a senator. There does not seem to be anything for us to do but wait until one side or the other comes out on top." Not a very broad view—that, from a senator who should be expected to be a statesman.

No better example of the vital interest of outsiders in this contest for power can be found than in the unhappy cases of men who are thrown out of jobs, or of industries which are seriously harmed, by being caught between the millstones of these two opposing powers.

The battle between C.I.O. and A.F. of L. for dominance of the Alaskan salmon industry is a case in point. A consent election under N.L.R.B. showed a slight C.I.O. majority, though more than half the companies had a majority of A.F. of L. supporters. This resulted in a ruling from N.L.R.B. that C.I.O. was to be the sole regional bargaining agency for all the employees regardless of prior affiliation.

At the outset, however, C.I.O. began to discriminate against A.F. of L. men. Threats and intimidation followed. In order to man the plants in far-away Alaska, some concerns had to allow C.I.O. to select the employees. Many A.F. of L. men of experience were left behind, despite understandings that their former employees should be taken on during the succeeding packs. Yet even though a plant can operate with all C.I.O. employees, the discriminated-against A.F. of L. former employees have the powerful support of the teamsters union at Seattle and other Northwest points. C.I.O. is affiliated with sailors and longshoremen. Movement of goods and ships, and loading and unloading becomes impossible.

Some fifteen concerns deemed it unwise to open their plants at all. Others curtailed operations. And rival unions struggle for supremacy.

A remedy is greatly needed Either the Wagner law should be repealed, or it should be so modified and implemented that it would become mandatory on N.L.R.B. to control labor racketeers and enforce its own rulings. The time has come for business to demand one or the other.

Dangerous Notions

SOME FOLKS think, or seem to think that good public relations can be purchased. They cannot. Like good manners, they can be acquired only by a sincere and conscious and continued effort.

Some seem to think that good public relations is a method of licking CIO. It is not. Nevertheless, if *all* industry had maintained good public relations for the past twenty years, it is doubtful if CIO would ever have come into existence.

Some seem to think that creating good public relations is a job to be delegated to somebody and then forgotten. It is not. A public relations man is a guide. He may be a good guide or a poor guide. But, unless the whole corporation, right down to the night watchmen and "mop-up-us" follows a good guide or a good map, it won't ever get toward the objective.

Some hold the notion that handing out a single "canned" presentation to the public will achieve good public relations. It will not, though it will help. But it is only one step—not the first step—on a long journey that should continue—from now on.

Public Relations Guide Map

GOOD PUBLIC RELATIONS result only from a proper mode of life: it is not a condition to be suddenly acquired.

In October, FOOD INDUSTRIES will concentrate attention on Why Public Relations, and How to Achieve Good Public Relations. What we shall have to say is, however, only a sort of road map and a description of the equipment one may need for the journey.

It would be folly, to pass such a map out to one's employees and others with the expectation that it in itself, will create good public relations. It is to be a guide map. But the corporation itself must take the journey. It cannot be done by proxy.

Putting ALL Executive Minds to Work

C. P. McCORMICK

Young, inspired brains in business prove valuable supplement to level heads of experienced executives

By C. P. McCORMICK
President
McCormick & Co., Baltimore, Md.

IN MANY INSTANCES, the most critical time in the development of a business is during the period when it ceases to be a one-man venture and, through necessity of expansion or some emergency, is brought under multiple authority. Then it either loses the dynamic driving force of an individual and drifts along or degenerates; or it is infused with new ideas and forges ahead under collective leadership.

From its establishment in 1889 by my uncle, Willoughby M. McCormick, until his sudden death in the fall of 1932, our company was largely a one-man business. This statement is not in any way to the discredit of Mr. McCormick. Despite many handicaps, including the wiping out of all his assets in the great Baltimore fire of 1904, he built up a large business, one that ground more spices than any other house and was among the leaders of the world in the production of other important commodities. His one-man policy was justified by his progressive success, and although he listened to the counsel of a few friends and some of his associates, he always relied on his own final judgment.

My uncle had no children, and when I was still a youngster he decided that some day I probably would head the company. With this anticipation in mind, he employed me during summer vacations for several years, and then, after I left college, put me through an extensive course of training. During seventeen years I was active in the various departments of the business, and worked my way up from handling freight on the shipping platform. I not only operated machines in the factory, but took a special course in the offices for several years, and then sold our merchandise in most of the states and several foreign countries.

Throughout my long apprenticeship and at frequent intervals, ideas came to me concerning possible managerial improvements in the business. At first, for several years, I relayed these ideas to my uncle in the form of suggestions. He listened patiently and with a peculiar smile; but to judge from the outcome, he immediately dismissed from his thoughts everything I had said. Finally, one day he informed me in unmistakable terms that my employment was in the field of being managed—solely and exclusively. Most of these ideas I tested by applying them, in imagination, to all that I knew about the avenues of trade. others I jotted down and studied from time to time. It was excellent mental exercise.

I do not blame my uncle. He was right from his viewpoint. He was of a generation that believed in keeping youth in its place. His attitude concerning the business was like that of a proud father toward his family, a father who does not realize that his sons and duaghters have grown up. And he resented what he considered to be my ignorant interference in the management of the business, just as the proud father would have objected to advice from a young upstart on how to raise his children.

A few weeks after my uncle's death, the board of directors elected me to the presidency of the company. Then I found that out of the hundreds of ideas concerning business management that had come to me, only a few had survived the wear and tear of time. The principal survivor concerned the advisability of giving the young men in the company not only more to say, but better opportunities for development and advancement; and that idea, I believe, was the beginning of our plans for multiple management.

Several bits of information I remembered contributed to the development of the idea. Somewhere, long ago, I had read that a psychological authority had said that the average business man utilized only about half of his mental capacity. For some time I seriously doubted the truth of that statement, until I had tested it out through self-analysis and my observation of others.

Our first objective then was to find a way to stimulate all of our executives to apply as much of their mental capacity as possible to the management of the business. It was necessary, obviously, to lift our men out of routine ruts which suppressed imagination and inventiveness, by confronting them with problems that were alien to their experience.

During the next meeting of our board of directors, I realized that nearly all of the members were past the age of 45 and several of them past 60. It is the habit of middle-age to dwell a good deal in the past, while youth invariably looks to the future. I was 36 and in an advantageous position. I vividly remembered the important experiences and impressions of my youth, and I realized that much of the thinking that guided the affairs of the company was the product of the automobile age, while what we required most was airplane consciousness.

The members of the board had

grown into the habit of confirming my uncle's judgments. All subjects of importance were discussed at board meetings, of course; but the final decisions invariably rested with W. M. McCormick. He knew more about the business than all members, and could argue them down on any point. And why take control out of his hands? He had managed the business well, for it always had paid satisfactory dividends.

But I had taken stock of myself and had arrived at the conviction that I possessed neither the ability nor the inclination to be the manager of a one-man business. I needed all the help I possibly could procure, and I impressed the members of the board with that fact. I also assured them that I realized the value of their individual experience, their mature judgment and their collective wisdom, but that I was convinced we should exhaust every source of ideas and information. I then proposed and explained a plan for the formation of a junior board of directors, and they promptly and unanimously voted to give the plan a thorough test.

So we organized the new board. I called together seventeen of our younger men who appeared to be promising. They were assistant department managers and others who had been taking a special interest in their work. At a preliminary meeting I carefully explained that our purpose was not to supersede the judgment of the men who had made the business a success, but to supplement that judgment with the energizing power of new ideas. I also explained that the greatest value anticipated was the training of executives and promised that, if the experiment was a success, all new members of the senior board of directors would be chosen from their membership in the future.

The men were given the customary rules to govern their meetings and told to elect two officers—a chairman and a secretary. It was suggested that the chairman and secretary be changed every three months so as to give as many as possible practice in parliamentary procedure. It also was understood that the junior board of directors was to be self-governing. We agreed that no official of the company would interfere with their "closed" or other activities, and that every recommendation they made for the advancement of the business would have the serious consideration of the company.

To give the junior executives a further insight into the management of the business, it was arranged to have the junior board meet with the senior board about once a month, with the junior chairman presiding, rather than the president of the company. With their own man in the chair, we thought that the youngsters would be more inclined to go to bat during discussions, and that was what we wanted. Another purpose was to demonstrate to the senior members the value of the work of the junior board to both the company and the men.

In May of 1934, I checked the minutes and records of the junior board, and found that practically every recommendation it had made had been adopted, and with some amazingly profitable results. I had expected some extremely radical proposals and was prepared to send them back for modification and further consideration, but the work of the board was found to be exceedingly conservative.

The minutes show that the youngsters had some tough battles and that many radical proposals were made, but in every instance the proposals were modified by discussion into unanimous recommendations or turned down. Almost without exception, the recommendations had proved to be sound economically and remarkably practical. Despite the depression, the business had forged ahead, and the records showed that credit for most of the improvement should be given to the junior board.

One of the first problems the board tackled was the repackaging and redesigning of a number of items in our large line of flavoring extracts, spices, other food products and drug specialties. At the outset of this effort, several of the young men introduced discussion of a traditional package of the extract business—the tall, thin, paneled bottle that was as old as the industry itself. This bottle was used by practically ever American extract manufacturer and was considered as a fixture in the industry.

Certain members of the junior board, constituting a majority, contended that this bottle had many faults that retarded sales, and that it should be changed. The minority expressed the thought that the design of the old bottle had a valuable trademark value because of its long and widespread use, and in this they were in agreement with the majority of the senior board.

It should be understood that our policy was and still is to present only the important recommendations of the junior board to the senior board for adoption. The new plan did not in any way alter the authority of the latter body to pass finally on all proposals concerning the management of the company, except those accepted by the president.

When the proposal to change the extract-bottle design reached an apparent deadlock, the junior board, as a compromise, voted for an investigation, which was promptly approved. Several thousand women were questioned as to their preference. Nearly every woman who reported expressed dissatisfaction with the tall, paneled bottles. They informed us that the conventional containers slipped out of hands covered with shortening, toppled over easily and frequently fell from kitchen tables, and that the cork stoppers crumbled and got into the contents.

When the next recommendation on the subject came from the junior board, it was supported by the emphatic opinions of more than a thousand women who were users of our extracts, and the recommendation was promptly adopted. A designer was called in, and after studying the findings of the consumer investigation, he produced a container that could not slip out of oily hands.

The new bottle not only is wedge-shaped, with indentations along both sides for the finger tips, but it has an honest broad base that will not allow it to tip over easily. And a convenient screw cap was substituted for the cork stopper.

These changes in the container resulted in an immediate and substantial increase in the company's flavoring extract business. The new design gave us attractive features to advertise, and it furnished many retail dealers with something new and appealing to display.

(Turn to page 524)

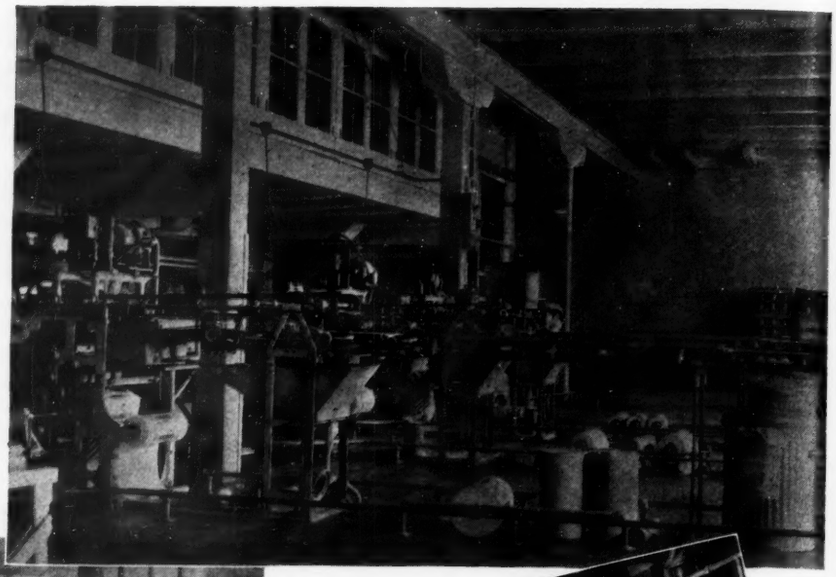
▶ This article is Chap. I of C. P. McCormick's new book, "Multiple Management." The remarkable job which "C. P." has done with McCormick & Co. deserves the careful study of management in every branch of industry. His book should be the Bible of management in these troublesome times, and no one can read it without deriving great enthusiasm and inspiration.

Publication of the first chapter of the book in* FOOD INDUSTRIES *is possible through permission of Mr. McCormick and the publishers, Harper & Bros., New York.—The Editors.

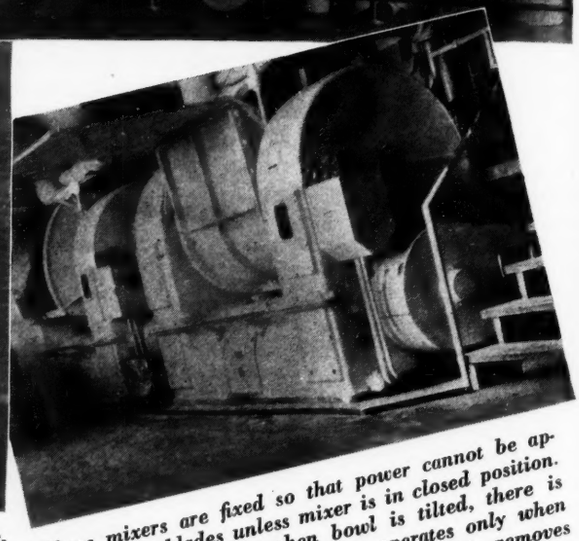
How We Made SAFETY

Systematic campaign against accidents proves high-return investment instead of expense

By
R. C. HAVEN
Safety Engineer,
Continental Baking Co.,
New York, N. Y.



For safe motor vehicle operation, not only must the equipment be in first-class mechanical condition, but it must be provided with needed safety devices. This truck, for instance, is equipped with a rear-view mirror on the right side as well as on the left to help the driver avoid collision with cars coming up from behind.



These mixers are fixed so that power cannot be applied to the blades unless mixer is in closed position. For operating blades when bowl is tilted, there is an auxiliary device. This device operates only when operator's hand is on power control. This removes possibility of hand being caught.

FOR EVERY DOLLAR SPENT for safety purposes, an average annual net saving of about $3 has been received by Continental Baking Co. That is the result obtained by the company after more than eleven years of experience with a systematic accident-prevention program in nearly 100 bakeries and among more than 3,500 driver-salesmen.

This saving has been possible because of the serious and the ambitious manner in which the company set out to see what could be done to lower the number and to reduce the seriousness of accidents among its employees. The job was a man-sized one. When the safety program was started, the company had 10,000 employees, of which about one-third were operators of horse-drawn, electric and gasoline vehicles. Another difficult factor to deal with was the scattered plant locations over the United States.

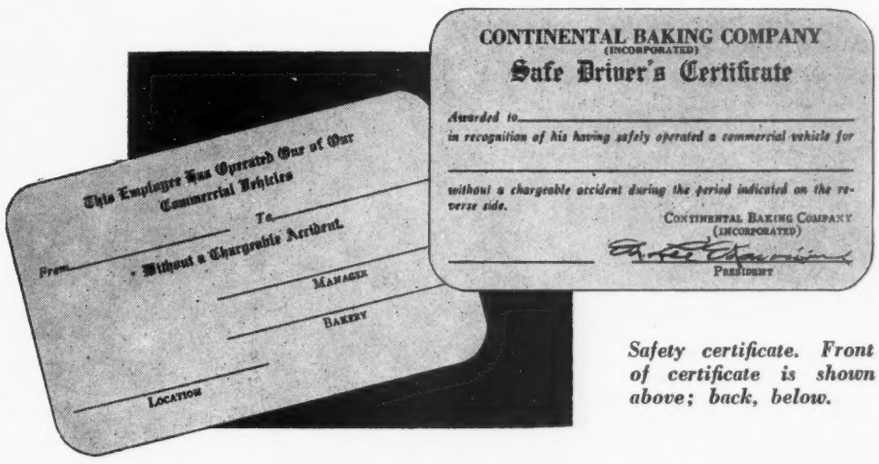
The problem was tackled on a long-time basis. The company officials realized that a few years would have to pass before there would be a return on the investment in accident-prevention work. Plans were made for a continuous and consistent program of engineering, employee education and safety-rule enforcement.

A full-time safety engineer was employed because experience had taught that accident prevention is a business —a business of selling, and of many other factors, of which the greatest is the human factor. And it is a business that has to show profitable returns if it is to justify its existence.

It was the safety engineer's job, with the help and advice of other departmental heads and the company executives, to check up on the plant and office buildings, production machinery and vehicular equipment for the addition of such safeguards as appeared to be necessary. It was also his job to educate the employees in

Pay 300 Per Cent Profit

Good housekeeping, so essential to safety, is illustrated in this plant of Continental Baking Co. Note arrangement of waste cans and spare rolls of wrapping paper. These are placed between small floor rails and under the conveyors, leaving the aisles free for safe movement of employees. Note also permanent installation of electrical conduit for each wrapping unit.



Safety certificate. Front of certificate is shown above; back, below.

proper accident-prevention principles.

This new company activity divided itself from the start into two major parts. One had to do with accident prevention inside the plants. The second had to do with the operation of the sales and delivery fleet of vehicles, which cover more than 50,000,000 miles yearly during all kinds of weather, over all kinds of highways and under all manner of street and highway conditions.

The work inside the bakeries was more easily handled than that having to do with fleet operation. Where necessary, illumination was improved to give at least twelve foot-candles of light at dividers, mixers, scaling and wrapping machines, eight foot-candles in the shipping and oven rooms and five foot-candles in general storage areas. Ventilation facilities are planned to provide three air changes an hour, or 20 cu.ft. of air per occupant, for the bakeshop in general and five air changes per hour around oven spaces. Mechanical guards were placed at every conceivable point of operation on all machines, and the floors and stairways were put into a recognized first-class condition. The job in the bakeries then became one of educating the employees to the hazards of their particular work and keeping the employees supervised to prevent violation of accident-prevention practices.

Inside the bakeries the hours of work are fairly uniform, the temperature and lighting conditions in the production areas can be controlled, and general working conditions can be kept from the wide fluctuations that take place on the streets and highways. However, daily inspections of machinery and of plant housekeeping, as well as constant supervision of the employees, are necessary.

Accident-prevention work inside and outside each bakery of the company functions under a committee whose duties are to meet regularly once a month, hear details from every employee who has an accident, determine causes of accidents, fix responsibilities and effect additional remedies for discovered plant and vehicle hazards. This committee is appointed by the plant manager. Its members consist of the chief clerk, plant superintendent, foremen, sales supervisors, garage foremen, several salesmen and other selected employees. Because of this accident-prevention work inside the bakeries, the relative frequency and severity rates have been materially reduced.

In the cold, material measurements of dollars and cents, the big saving from our safety work has been in the cost of the insurance covering both our fleet operations and our employees. Before we started our safety program, several insurance companies had refused to insure us against automobile public liability unless we paid them twice the regular rates. After our safety program began to show results, we were able to secure lower rates each year because of our better record.

One of the first steps in the campaign to curtail vehicular accidents was to check every vehicle to make sure each one was equipped with the required safety devices to help the salesmen avoid accidents. Additional windshield wipers are used in snowy country, rear-view mirrors for the right as well as for the left side of the trucks are installed under certain conditions, anything besides official stickers are prohibited on windshields, and the width of the corner posts of the cabs has been reduced to further improve visibility. Defrosters are provided in the colder regions, of course, and fog lights are regular equipment when needed. Speed is controlled by governors. Every safety device required by law, and some that are not, are provided.

By seeing that driver-salesmen were made responsible for operating trucks with only good brakes and horns, clear vision, good steering mechanisms and the like, their interest and confidence were enlisted in the program. The company, of course, was in a position to expect whole-hearted cooperation from its employees. But experience shows that furnishing safe, attractive equipment is the first step in developing an accident-prevention attitude on the part of driver-salesmen.

Our problem of truck operation is much greater than that of companies doing a regular hauling business. Our operators are primarily bread and cake salesmen. The driver of a bread truck has a host of sales problems which occupy his mind and may distract his attention while driving. Selling is his

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▶ ***Safety problems of the food-plant executive are two-fold. They involve not only employees in the factory but those operating motor vehicles on the highways. Mr. Haven tells the value of a double-barreled safety program and shows how he successfully carried it out. All of which makes this article of practical value to***

Every Food Manufacturer and Distributor

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primary job. The regular truck driver has little to occupy his mind other than loading his truck, driving it to one or more destinations, and unloading it.

Consequently, when starting our safety campaign, we took into consideration the type of men we were dealing with in our educational work. The big job was to get them to see the necessity, from the safety standpoint, of driving their trucks safely when on the highway and of concentrating on selling their goods when in the customer's place of business—not while behind the wheel.

We knew that was our biggest job with the salesmen because analysis of our automobile accidents showed that more than 90 per cent of them were the result of inattention. They resulted from carelessness in backing and in pulling from the curb, from following or passing too closely, failure to grant right of way, violation of traffic signals, improper turns and improper parking, excessive speed for the highway conditions and many other acts that could be traced very definitely to mental distraction.

With this knowledge of our men, their problems and what was causing the accidents, we established what has proven to be a very profitable plan of procedure—profitable to both the employees and the company. The first step was our policy of providing the salesmen with mechanically safe equipment. Secondly, and even more important, was the careful selection of men to drive the trucks. For this selection we have adopted a definite and effective procedure.

WHEN A MAN applies for a job as salesman, we first learn his background—who he is, where he has worked and what his accident experience has been. He must be of the salesman type, of course. But since an accident-prone driver cannot possibly be a profitable salesman, we want to know, first of all, the man's ability to drive a truck safely.

Having satisfied ourselves in regard to his record, the prospective salesman is sent to a doctor for a complete physical examination. In many states there are "foodhandler's" laws, but we also want to know that our salesmen are physically fit and able to drive a motor vehicle safely. Driving any kind of a truck is not easy at best, and such physical defects as bad vision, poor hearing and others equally serious constitute a hazard not only to the driver but to all who have to deal with him while driving.

Two other important factors are involved. They are the driver's mental calibre and his aptitude while behind the wheel of a truck. Driving a pleasure car is one thing and driving a truck is another. Some men cannot drive both with equal efficiency. For this reason the applicant is required to read the section of our salesmen's safety manual covering the handling of our equipment and the rules of the road. No time limit is set for the reading. As soon as the applicant feels he is ready, he is subjected to an oral quiz.

SHOULD HE PASS this quiz satisfactorily, he is driven by the garage superintendent to the edge of town and asked to take the wheel of the truck. Over a predetermined route he drives the truck back to the bakery. The superintendent observes his driving. During the return ride, every possible traffic condition is encountered—straight roads, hills, curves, school zones, street cars, traffic lights and stop streets. Turns, hand signaling, backing and parking are also included in the test. In this manner an opinion generally, although not always, is formed as to the man's driving ability. Sometimes an applicant is rejected before he gets very far with his driving test. Usually the man shows ability, or at least an aptitude for driving.

Those that pass the driving test are turned over to the sales supervisor, who completes the safety and sales education. At this time the applicant also learns about the accident forms and what he is expected to do in case of accident.

When fully instructed as to his duties, the new salesman is driven by the supervisor over his prospective territory or route until he becomes familiar with his stops, knows his customers and, by occasionally driving the truck, gets to feel at ease behind the wheel. His breaking in may take a week or ten days. The company will not permit a salesman to take a car out alone until he shows that he is fully capable of doing so.

Besides all this, the activities of the salesman are closely supervised. He is checked periodically on his conduct while driving, also on the development of any unusual problems that may cause him to take his mind off his driving. In addition, a constant check of his route and general territory for serious traffic hazards is made. And changes in routes are expected when necessary to minimize the hazards of driving.

In connection with the truck-operation program, we have certificate and pin awards. These awards are presented to the salesmen not as rewards for safe driving but as badges of merit. A card or certificate is given for driving six months with a clear record. Bronze pins are presented for one year, silver for two, gold for three and gold with a diamond for five. After the fifth year, the numerals are changed to show additional years of safe driving. Each pin is accompanied by a certificate showing the length of time covered by the pins. The certificates, or cards, are of pocketbook size, printed on durable stock. They are of high value to the salesmen, especially when they are called upon to qualify as careful operators.

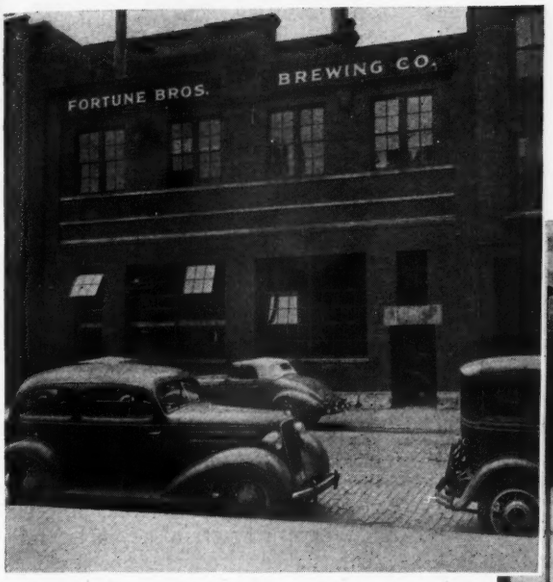
The pins are very popular. Much to our satisfaction, 563 got their six-year numerals as of Jan. 1, 1938. When this practice was started Jan. 1, 1932, it was felt that if 250 salesmen went through the five-year period without an accident for which they were responsible, we should be well repaid. As a matter of record 693 received their five-year pins as of Jan. 1, 1937. Since that time, 198 have been handed out as they became due the first of each month.

The penalty exacted whenever a salesman is charged with the responsibility for an accident is that he must start from "scratch" to qualify for the awards.

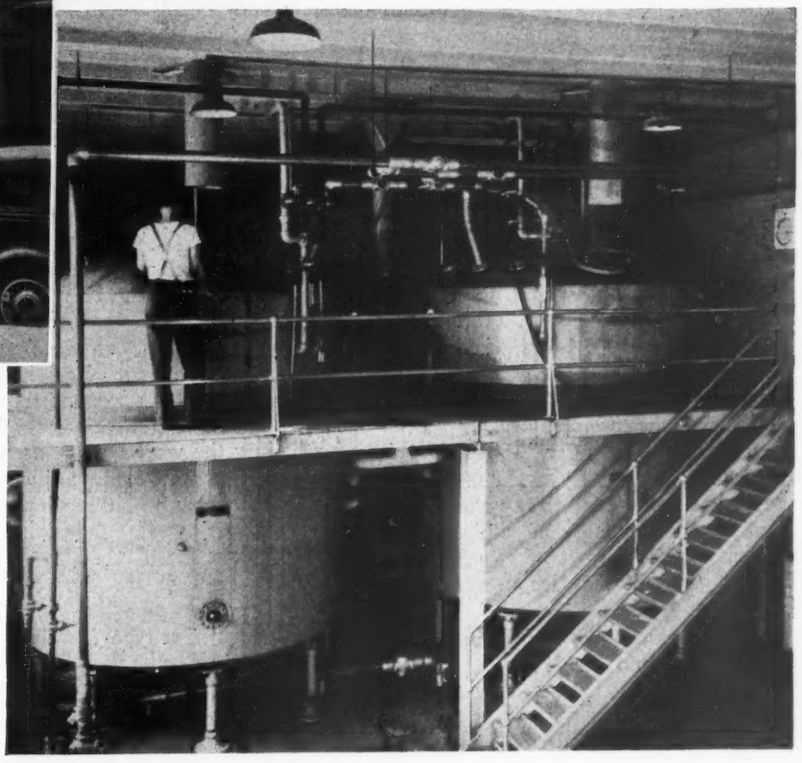
The results of this accident-prevention work, in addition to the benefits already given, are that it has lowered operating costs by eliminating wear and tear on machinery, tires and motor equipment and by reducing consumption of electricity, gasoline and oil.

Fleets as small as five vehicles may be able, under certain conditions and in many localities, to show a considerable saving in their insurance costs if their accident records are good. Our plan is such that with a few modifications it can be applied with profit by a small fleet, as in the case of our smallest bakery.

But, accident prevention is a long-haul program. It requires constant rather than sporadic effort to develop a good experience and to get the results desired. Enthusiasm for our safety program is sustained because it has proven profitable to all parties concerned. From a dollars and cents value alone this accident prevention program has proven a profitable investment. Over the past ten-year period, our savings in insurance premiums and our reduction in accident repair costs alone have been many times the total spent for accident prevention. Such a return is a paying project in any business. And other factors, such as saving in loss of time, physical suffering and worry by employees, give additional benefits.



Brewhouse in which the simplified system of brewing is used has the exterior appearance of a light manufacturing plant or a two-story shop or office building.



Cooking and brewing activities under the new system are carried out in two 142-bbl., glass-lined digesters equipped with propeller-type agitators.

Study of UNIT OPERATION *Simplifies the Whole Process*

Fine grinding of malt changes brewing practice

By JOHN L. FORTUNE
President, Fortune Bros. Brewing Co.
Chicago, Ill.

FINE GRINDING in preference to standard crushing of malt does not, on first thought, strike one as being a determining factor in the adoption of a new system of brewing. Yet, reaching a decision on that question delayed reentry of the Fortune Bros. Brewing Co. into the cereal beverage industry following the repeal of Prohibition in 1933.

Making that decision involved far more than the adaptation to brewing of a mill in which the malt is ground to flour-like fineness so that more than 90 per cent will pass through a 50-mesh screen. That departure from traditional practice of the brewing industry carried along with it fundamental changes throughout the entire brewhouse procedure and involved a technic in connection with the mashing process which intensifies and stimulates enzymic activity to a degree not attained in conventional brewing.

Thin mashes, continuous agitation

Here is a striking example of the dollar-and-cents value that can arise from the study of a unit physical operation. It merits the attention of

All Food Engineers

during the entire mashing process, adaption to brewery use of some equipment hitherto used in other food industries but never so far used in brewing, reduction in processing time, in floor space and in power and labor requirements, and wort separation by pressure filtration are some of the outstanding features of the process used in the Fortune plant.

More than two years of operation has proved that this departure from conventional practice is both a technological and commercial success. The simplified procedure and the lowering of the cost of production are incentives towards the selection of ingredient materials of choicest quality. The result is a beer which has consumer favor and which, we think, need fear no comparisons, even with so-called "luxury" beers, including imported brands.

The brewing materials are used in the usual proportions. They are handled in such a manner, however, as to be more completely acted upon by the malt enzymes and to become sufficiently more available as soluble constituents of the wort to produce a 6- to 8-per cent increase in practical brewhouse yield.

The processing steps are intensified, speeded up and held under better technical control. In fact, they can be made almost automatic by the use of electrical control devices. They are carried out in units of equipment which can alternately be used for successive steps of processing. This means that brewhouse equipment need no longer be massive in construction nor conform to traditional designs. In fact, many a visitor upon entering the brewhouse for the first time is struck by the resemblance to other food-processing plants, such as those of the dairy industry.

In our 700-bbl.-per-day brewhouse, the malt is ground to the desired degree of fineness in a swing-hammer mill which delivers between 5,000 and 6,000 lb. of pulverized malt per hour and is operated at about 3,500 r.p.m. from a close-connected, 40-hp., induction motor.

This mill is mounted in the basement, along with the air, CO_2 and ammonia compressors. As fast as the malt is ground, it is carried by an air lift to the scale hopper on the second floor, which empties directly by chute into either of two glass-lined digesters.

These digesters, which are 142-bbl., closed units, are the heart of this new system of brewhouse procedure. Vertical in position, cylindrical in shape, insulated and steam-jacketed in construction and semiautomatic in operation, these digesters replace the cumbersome and varied units which comprise traditional brewhouse equipment. They serve successively or alternately as mash tubs, raw-grain cookers and brew kettles. Their size can be selected to suit any given production requirements. In the Fortune plant, the two 142-bbl. digesters can easily take care of a daily production of 700 bbl. of beer or ale.

A desirable feature of these digesters is that their glass lining prevents any contact of the mash or the boiling wort with metallic surfaces. Each digester is equipped with a variable-speed, propeller-type agitator near the bottom, which keeps the contents in constant, yet well-regulated, agitation.

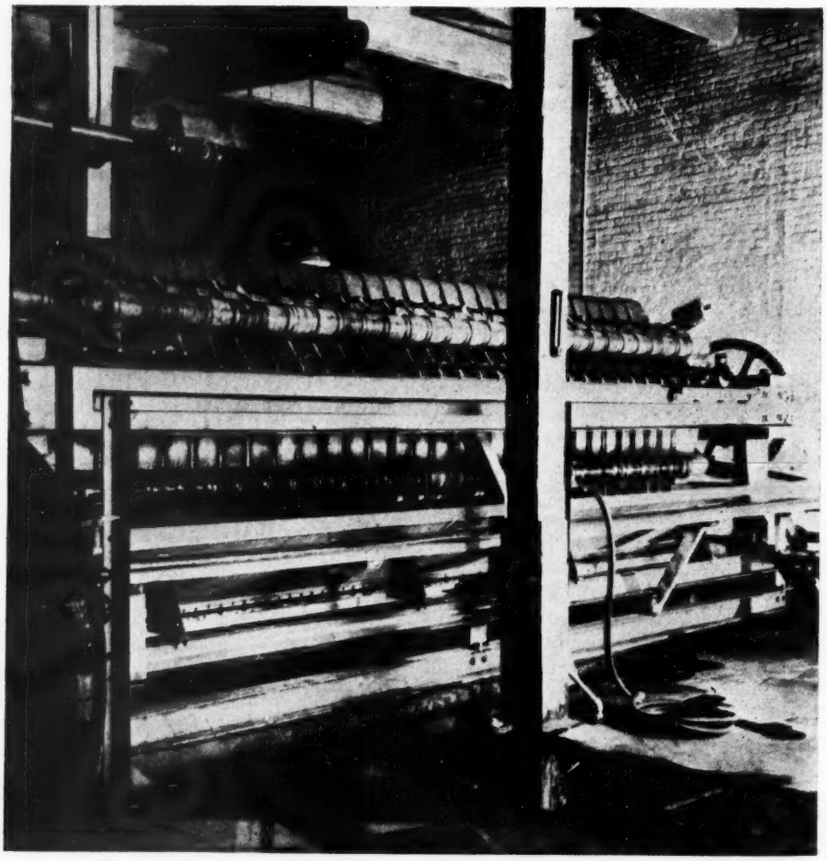
Operations in this brewhouse are scheduled so as to approach a continuous-flow process as closely as is possible in brewing. For instance, while one digester serves as the mash tub, the other one serves as the kettle for boiling the wort from a preceding brew. Or, it raw-grain adjuncts are used, the cooker mash is prepared in one digester while the other one serves as the mash tub.

The digesters are interconnected by 3-in. copper pipe lines with sanitary fittings of a type familiar to the dairy industry. They operate under a steam pressure of 5 to 7 lb. per square inch instead of the 25 to 40 lb. ordinarily needed for conventional brewhouse equipment.

The brewhouse procedure is started by "doughing-in" the malt at the usual temperature—either 35 or 45 deg. C. (95 or 113 deg. F.). The mash is raised through stages of temperature conducive to selective enzymic action, as done in customary practice, with two exceptions: (1) the quantity of water used for mashing is considerably increased to give a decidedly thin consistency to the mash, in contrast to the sluggish heaviness of ordinary mashes, and (2) agitation is constant throughout, even during the so-called "rests" of the conventional procedure.

Where raw-grain adjuncts, rather than flaked products, are used, the cooker mash is prepared in one of the digesters, again quite in the usual manner. The same method applies to the boiling of the wort and hops.

At the end of the mashing process, the contents of the digester are forced by an 18-in. rotary pump into a mash filter. This filter may be operated with a variable number of 42x42-in. frames, depending upon the volume of the "spent" grains, for the separation of



Both the mash and the hopped wort are freed of solids by passage through a frame-type mash filter under pressure from a rotary pump.

the liquid wort from the solid residue under pressure. Low in the beginning, the pressure increases to 55 lb. per square inch towards the end of the filtering operation. The spent grains are sparged with warm water for the effective removal of the remaining soluble extract and then dumped into a screw conveyor for transfer to a disposal chute. The brilliant wort is pumped back into a clean digester, where it is boiled with hops.

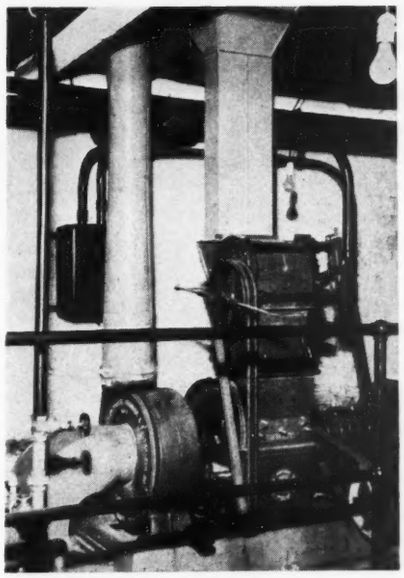
The separation of the first wort and sparging of the spent grains for a 150-bbl. mash is performed quickly and efficiently. This operation is carried out at a substantial saving in time as compared to conventional procedure. The saving is conservatively as much as 2 hours per brew.

Upon completing the addition of hops and boiling of the wort, the mash filter serves for the separation of the spent hops and the coagulated substances. This double-service feature of the filter eliminates the necessity for a separate hop jack or strainer, a standard item of equipment in the ordinary brewhouse. At this step, the relatively small volume of the spent hops, as compared to that of the spent grains, requires the use of only a small number of filter frames to obtain a brilliant wort, completely free from protein or resinous sludge.

From this point on, the handling and processing of the wort to make the finished beverage is carried on under close control of the cooling of the wort, its fermentation—either bottom fermentation for beer or top fermentation for ale—its aging, clarification and storage preparatory to marketing.

From the filter the hot wort goes to a 165-bbl. wort tank which serves as a surge tank for the double-pipe, two-step cooling system. In the first step the wort is cooled to a temperature of 75 to 100 deg. F. by city water. In the second step it is brought to pitching temperature (45 to 47 deg. F.) by direct-expansion cooling with ammonia. As the wort flows through these cooling coils, it is aerated by needle-point jets of filtered air from a Nash Hytor motor compressor. So when the cold wort reaches the fermenting tanks, it is ready to be pitched with yeast.

The fermenting tanks are upright, cypress units lined with brewers' tank coating. In both the closed and the open tanks (ten of 110-bbl. and ten of 55-bbl capacity) the fermentation proceeds in the normal manner for a period of seven to nine days, depending upon the degree of fermentation desired and the strength of the yeast. The fermenting cellars are maintained



Malt is ground to flour-like fineness by a swing hammer mill in basement and carried by air lift to scale hopper on second floor of brewhouse.

at a uniform temperature by means of Carrier air diffusers, which insure a low CO_2 content in the washed air, freedom from air-born infections and dry walls and ceilings.

At the end of the fermentation period the beer is mixed with a diatomaceous filter aid and run through a small 15-plate, 20x20-in. Sperry filter. By this procedure yeast-free, brilliant beer is delivered directly from the fermenters into the Pfaudler vertical, pressure, storage tanks. In these nine 168-bbl. and five 222-bbl. glass-lined "uprights," the beer is immediately carbonated and kept under CO_2 pressure for an adequate aging period of four weeks minimum. Uniform diffusion of the CO_2 throughout the beer and even, progressive and complete adsorption or "binding of the gas" are obtained. These conditions are effected by delivering the carbon dioxide collected from the closed fermenters through three Lamson-type stone diffusers placed near the bottom of each tank. The carbon dioxide is collected from the closed fermenters by an automatic Hasselberg wet compression system.

In the storage cellars unit coolers of a type similar to those mentioned in connection with the fermenting cellars keep the air at the desired temperature and humidity. The same is true in other departments of the plant, such as the hop-storage room and racking cellar.

The departure from the conventional procedure of brewing outlined in this article is not simply a speculative thought or idea put to a trial on an industrial scale. Instead, it represents the commercial application of results of researches which were carried on over many years in the interest of improving the quality of malt beverages and of utilizing modern developments of processing and engineering in an industry whose conservatism is well-nigh proverbial.

For generations the making of malt beverages has followed the same time-honored brewhouse procedure. Through all these years brewhouse equipment has, in effect, consisted of: (1) a cooker for the so-called raw-grain adjuncts, the starchy materials from cereals which require gelatinization by cooking before becoming available to extraction and enzymic activity; (2) a mash tub, in which water and the application of heat promote enzymic processes to make from 64 to 92 per cent of the ingredients soluble and to hydrolyze a suitable fraction of this soluble extract into fermentable and yeast-assimilable substances; (3) a lauter tub or spent-grain strainer for the separation of the solid residues from the wort (the liquid portion of the mash) and for the sparging or leaching out of these spent grains; (4) a brew kettle in which the added hops are extracted by the boiling wort to impart the characteristic flavor and aroma, the heat-affected proteins are coagulated and the wort is concentrated through evaporation; and (5) a hop jack or strainer for the separation of the spent hops and the sludge consisting of proteins and resinous matters from the wort.

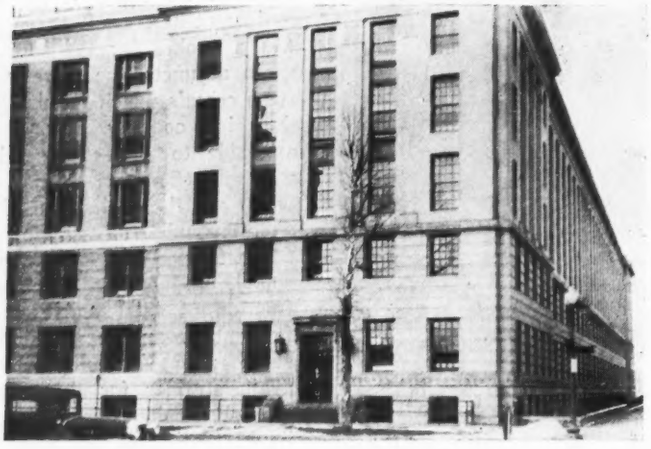
For proper functioning, these conventional units of equipment require that the malt be crushed instead of ground. This crushing is done on a standard corrugated-roll mill. The resulting product is such a coarse assortment of crushed malt that, on the average, only approximately 10 to 20 per cent will pass through a 50-mesh screen, in contrast to at least 90 per cent in the case of the fine grinding practiced at Fortune's.

In successful brewing, the rôle played by the action of the malt enzymes during mashing is of such importance that ever since the fundamental researches of Pasteur, brewing scientists and technologists have studied the various factors which influence and control this enzymic activity. These factors came in for considerable study as the result of a problem arising in the production of near beer containing less than 0.5 per cent alcohol during the Prohibition era. In addition to other objectionable properties, this beverage was

(Turn to page 521)

How to Establish Standards Under *New* Food Law

This may be done now. Immediate action by food industries suggested



Offices of Food & Drug Administration are in this building in Washington, D. C.

By

ALBERT K. EPSTEIN

President, The Emulsol Corp.

and

A. L. ISRAEL

Food Law Attorney, Chicago, Ill.

THOSE in the food industries who desire to see official food standards adopted, or want to see present tentative standards of the Joint Committee modified or repealed, are offered a new procedure under the new food law.

No authority or power is granted to the Secretary of Agriculture, or to any one else, to establish standards of quality, strength and purity for food and food products under the Food & Drugs Act of 1906 (which remains in effect until June 25, 1939) except under the Mapes' Amendment. That amendment gives authority to the Secretary to establish a minimum standard of quality for food put up in hermetically sealed packages.

For many years, however, there has been in existence an extra-legal body called the "Joint Committee on Definitions and Standards" composed of nine persons, three from the Department of Agriculture, three from the Association of Official Agricultural Chemists (AOAC) and three from the Association of Food & Dairy Control Officials. The committee has met at irregular intervals and has developed and promulgated a great many tentative standards for foods and beverages.

Albert K. Epstein is also connected with Epstein, Reynolds & Harris, consulting chemists. A. L. Israel is a member of the Illinois bar and a former Illinois state analyst.

These standards have been published by the U. S. Department of Agriculture and copied by a large number of states, either by indirect reference in their laws and regulations, automatically adopting them as and when made, or by enacting them directly into the statutes by copying them.

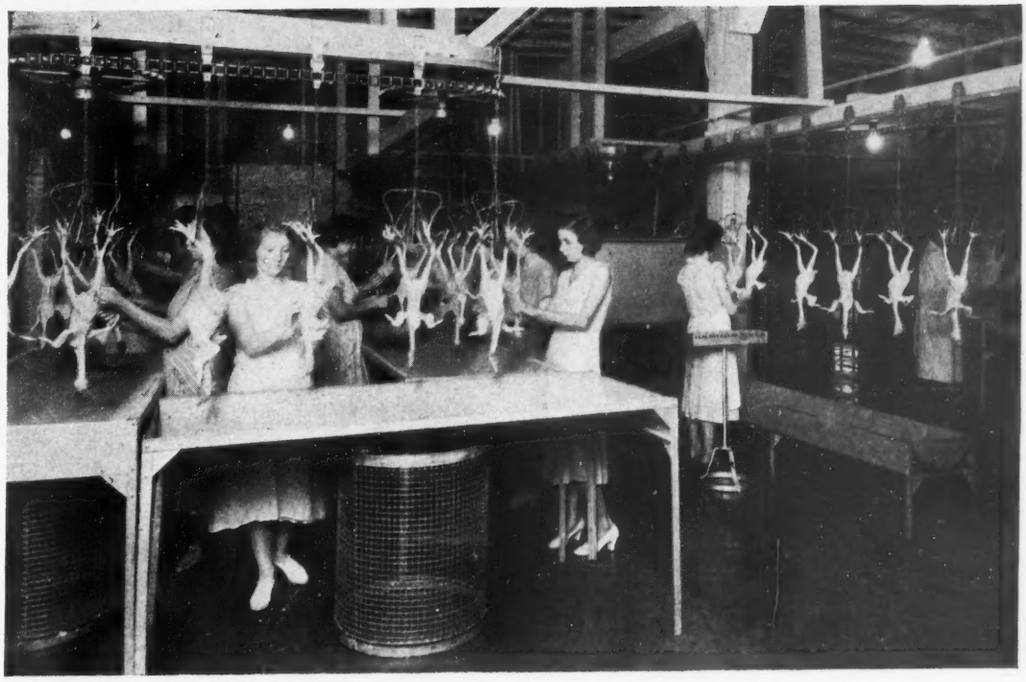
The standards of quality, strength and purity adopted by the Joint Committee have had absolutely no force or effect of law. And the Secretary in publishing them did not so claim (merely stating in the preface thereto that they were used as a guide in enforcing the Food & Drugs Act, *i.e.*, they expressed his opinion of what certain articles of food should consist). Nevertheless, in the practical enforcement of the law the various local station officers before whom alleged violators were called for a hearing always gave the respondent to believe that such standards were fixed and binding on them. In fact, many and probably most of the actions brought against food manufacturers, wherein the question of a standard for the article under suspicion has been involved, have definitely state the provision of the standard for such article as determined by the aforesaid extralegal Joint Committee.

That Congress, in enacting the 1906 act, did not desire to permit the adoption of standards under the act can be plainly seen from the record of the debate on the bill. That the Department of Agriculture, or its Secretary, plainly needed the authority under the 1906 act was forcibly brought to public attention in a recent criminal case brought by the department against a large preserve manufacturer. It was alleged in this case that the preserves did not conform to the standard adopted by the Joint Committee.

At the opening of the case the government attorneys frankly admitted to the court that there was no legal standard for preserves, nor for any other article of food except butter, which butter standard was fixed by Congress in 1923. It was stated that it was the intention of the government to prove a "trade standard" for preserves by the testimony of experts in the industry. The defense contended that no person or group of persons in the trade could fix a standard in the trial of a criminal case by which a person could be punished.

The government then endeavored to prove a standard by having several preserve manufacturers testify as to what they considered to be a standard preserve and what the trade considered as such. Upon objection, the court struck out all the testimony of the trade witnesses relating to other than their qualifications and the fact that they knew how to make preserves. Household-science teachers and housewives were produced, but the court refused to allow them to state other than their names, qualifications and that they knew how to make preserves. This left the government's case high and dry on the question of standards. In fact, the court had several conferences in chambers with the attorneys and stated to the government that the

(*Turn to page 520*)



Highly mechanized operations and dry, sanitary working conditions identify the up-to-date, present-day poultry packing plants.

Poultry Packers Put QUALITY *Under Control*

Mechanized handling, temperature regulation and other improvements preserve quality put into birds by better breeding and feeding

PART I

By
GEORGE F. STEWART
and
HARRY E. DREWS

Omaha Cold Storage Co., Omaha, Neb.

▶ ***Anyone who fails to recognize possible angles of attack on production problems or methods of introducing quality control should read this article. Probably you don't pack poultry, but this description shows what can be done to improve and control an apparently simple and primitive procedure. It should be read by***

All Food Engineers

POULTRY MARKETING, as an industry, is young. Within the memory of present-day men, it has grown from a back-yard side line to a sound and vigorously organized business. As in other food-producing industries, the developments in the poultry industry have not been accidents. Demand for a dependable supply and a good-quality product has had its influence. Developments in other industries supplying protein for the human dietary have made necessary the adoption and application of methods and practices for raising the quality of poultry to a higher and more uniform level than was possible a surprisingly few years ago. These methods and practices are (1) selective breeding and feeding, (2) grading, (3) central-station fattening and (4) mechanized slaughter and dressing.

Of these factors in the production of high-quality poultry, the packer has least control over those having to do with breeding and feeding during the growing age of the poultry. However, the leaders in the poultry-packing industry are exercising more and more control over the type of poultry raised by growers and how it shall be fed during the pre-marketing period. This control is applied largely through educational efforts, packer ownership of hatcheries and buying on a grade basis.

Full benefit of breeding and feeding control is a long way from realization as yet, because the fountainhead of the poultry-packing industry is the general and diversified farm of the Central, east-Central and mid-Western states—the corn belt. Here the poultry flock is only one of the enterprises which contribute to farm income by producing more than is needed to supply the farm family. The surpluses of a large number of such farms go to make up the surplus of a community or geographical area and become the available supply for poultry consumers in metropolitan areas or in geographical territories unsuited to poultry raising.

Chickens on these general farms are largely of the general-purpose type. They are raised for both eggs and meat. So the heavy American breeds

predominate over those animate egg-laying machines, the light-weight Mediterranean breeds.

It is in these general farm areas that the poultry-packing plants have been located. These plants fatten, slaughter, dress and pack the surplus poultry produced within practical trucking distances of their doors. In some cases, the live poultry is delivered by the grower and sold direct to the packer. Other times, it is sold to private truckers operating farm-to-farm truck routes. In still other instances, it is delivered to local poultry-buying stations and held for the trucks of the packers. In any case, it is only when the poultry arrives by truck or car at the receiving room of the packing plant that it comes under the direct control of the packer.

At the receiving door, the poultry is weighed, graded according to type, age and general physical condition into feeding batteries, and wheeled to large, ventilated, soft-lighted rooms for finish fattening. Specially ground grains or grain byproducts and condensed buttermilk are used for feeding. Fattening is carried on under regulated conditions with the birds being fed to capacity twice each day. By controlling the ventilation, uniformity in temperature is maintained as closely as possible, and high humidity is obtained by water-spray systems. The length of the fattening period depends on the rate of gain, the condition of the poultry and the cost of feed and operation as compared to the value of the weight gained.

Dressing of poultry involves three distinct operations: slaughtering, semi-scalding and feather removal. Correct correlation of these three operations is essential to give a clean, attractive well-bled bird. The slaughtering of poultry has received little, if any, attention from technical workers. Until recently, the factors promoting maximum bleeding and feather-muscle relation have scarcely been studied. Some little work has shown that bleeding is most effectively done by severing the neck arteries and that feather-muscle relaxation is obtained by piercing a portion of the brain or by placing the bird in hot water (126 to 130 deg. F.).

At present, electrocution shows considerable promise as an aid in solving the slaughter problem. The electrocuting machine combines a rotary knife with the electrocuting device. The chicken's head is placed in a holder attached to an endless chain conveyor. A trip switch turns on a high-voltage (1,000 to 1,500 volts), low-amperage current which stuns the fowl immediately. Then the high-speed rotary knife makes a clean cut through the veins and arteries of the neck, after which the fowl is conveyed to the scalding tank.

Acme

Adoption of the electrocuting method of killing puts poultry slaughtering on a controllable basis, with the elimination of broken wings and damages to the skin and meat of the fowl.

Viewed from at least three angles, the electrocution method shows promise of replacing the old-time killer with his knife. One of its advantages lies in its adaptability to an out-of-way killing plant where the full-time services of a good killer are not always possible. A second advantage is the elimination of broken wings in broilers resulting from the vigorous struggle that follows killing by the old method. Electrocution stuns the bird and the death struggle does not take place. Of equal importance is the uniformity of slaughter by this method, which is far beyond that of even good manual operation.

The function of scalding is to loosen the feathers to make easier their removal. Originally, this operation was done with scalding water. Early observation indicated that this practice seriously impaired keeping quality and appearance of the dressed poultry. The so-called "dry pick" was adopted. This technic depended on the touchy operations of "braining," piercing a certain portion of the brain with a sharp knife and severing the arteries. By removing the feathers rapidly before the feather muscles again contracted, excellent dressed poultry resulted. However, this practice required almost perfect timing of several operations. In commercial application, mis-bleeds were frequent, as were also birds with torn skins. An alternative developed during the past ten years is the so-called "semi-scald." This system is now quite well standardized with the water temperature ranging from 126 to 130 deg. F. and the immersion period limited to from 15 to 20 sec. in vigorously agitated water. Excellent results are obtained. Feather removal is easy. The relaxing effect on the feather muscles is practically permanent, with no detrimental effect on appearance or keeping quality of the picked bird.

Methods of feather removal have changed so markedly in the last ten years that few "old timers" would recognize a modern picking room. Many attempts have been made in the past 30 years to use waxes in feather removal, but little was done commercially until the Rosenberger process was disclosed about 1931. That process involves the following steps: (1) removal of the main bulk of easily plucked feathers by hand, (2) thorough drying of remaining feathers and hairs, (3) dipping fowl in a molten wax mixture, (4) cooling wax to the elastic stage and (5) removal of wax with the feathers and final clean-up. In practice this standard plan of operation is generally followed as shown in the diagram.

The advantages of the wax-picking method are straight-line, continuous operation, reduced picking costs, a better picking job and less tears, pins, and hairs.

Temperature is the quality-control factor in every wax-process picking room. For that reason, most of the picking rooms are equipped with numerous thermostatic controls. The drying temperature must be held between closely regulated limits for maximum drying of the feathers without

injury to the flesh. The wax-dipping and cooling temperatures must be controlled accurately to achieve proper coating and wax consistency for efficient feather removal. Further, it is important that temperatures at different points be correlated; birds coming out of the dryer too warm are inclined to smear when wax-coated, while birds dipped in wax too cold gather a heavy coat that is hard to temper and remove. Only through accurate temperature control can efficiency be maintained throughout the dressing operations.

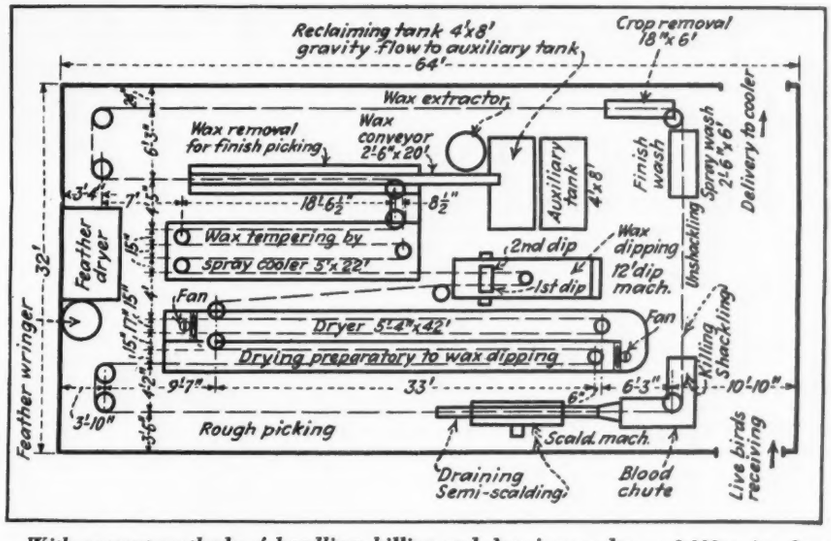
Transfer of the birds from one operation station to another is made continuously by means of shackles attached to a chain conveyor. After the semi-scald, several "roughers" remove approximately 75 per cent of the feathers, including all quills. The remaining feathers are thoroughly dried during passage of the bird through a long chamber in which warm air circulates. An air temperature in the neighborhood of 90 deg. F. is preferred to avoid undesirable changes in the appearance of the poultry, the epidermis of the skin being particularly sensitive to abrasion after it has been heated.

After cooling slightly at room temperature, the birds move along the production line and trip a switch which raises a counterweighted dip tank to completely cover each fowl with the molten wax mixture. Completing a wax-cooling cycle, each bird returns to the same dip tank a few seconds later to receive another coating. Accurate control of wax temperature is important to get the proper adhesion to feathers and "pins" as well as to produce a coat which can be removed easily and in large pieces. Depending on the wax composition used, the temperature will be 115 to 130 deg. F. Rosenberger, Independence Produce Co., Independence, Iowa; Swift & Co., Chicago; and Grace, National Research Council, Ottawa, Canada, have proposed various wax mixtures for this process.

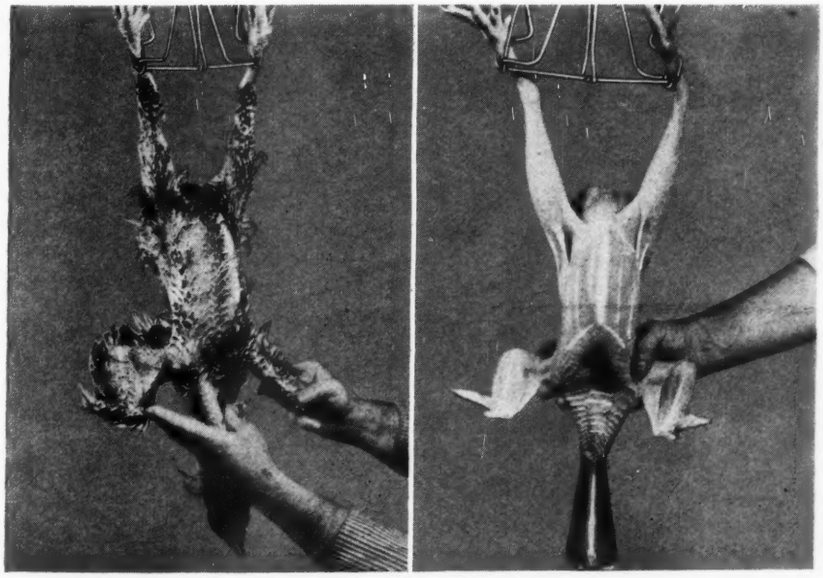
After the second dip, the waxed bird enters a spray chamber in which the coating is tempered with water sprays to become tough and elastic. This tempering is a matter of time and temperature. Experience with the individual equipment makes possible satisfactory manual control; automatic control is not practical.

If this tempering is correctly done, the "dewaxers" should be able to strip the wax from the birds in large portions, and the fowls will be almost entirely free of feathers, pins and hairs. But little work remains for the cleaners and inspector before the birds are given a final cleaning with high-pressure water sprays.

For recovery of the wax, the wax-feather mass is conveyed to a reclaiming tank where it is heated to 250 deg. F. for removal of moisture preliminary to separation of the feathers in a perforated centrifugal extractor. After cooling, the wax is again ready for use. Actual wax loss will average in the neighborhood of two to three pounds per hundred birds.



With present methods of handling, killing and dressing poultry, a 2,000-sq.ft. plant area will take care of 600 chickens per hour, according to the Barker Poultry Equipment Co. layout for a killing plant.



When the "pinney" chicken has passed the "rough" picking station, it may present as discouraging a problem, as does the bird on the left. But after the wax-picking treatment, pin feathers, hairs and the like are gone.

The poultry, now free of feathers, but still with head, feet and viscera, may be packed in the standard commercial boxes of twelve head each, branded, marked and sold as "round dressed" poultry. Or it may be moved on, after chilling, to the eviscerating process, the next step in the preparation of up-to-date market poultry—full-dressed, or ready-to-cook, birds. Most birds in recent years have been marketed in the round dressed form. But the development of ready-to-cook poultry—with its fine flavor, convenience, merchandising advantages, consumer appeal and lower transportation cost—is bringing about a rapid change in the approved methods of poultry processing and marketing.

The complete dressing, packaging and quick freezing of poultry will be the subject of a second article on the poultry packing industry, to be published in the next issue of FOOD INDUSTRIES.—THE EDITORS.

Why We Built "57th STREET"

Reasons behind construction of world's largest milk plant

Sheffield's 57th St. dairy—world's largest milk plant. There is nine acres) in this one plant.

By L. A. VAN BOMEL

President, Sheffield Farms, Inc.
New York, N. Y.

MANY FACTORS entered into the executive decisions which culminated in the construction of our new plant at 57th St., New York City. Nearly all of them were related to distribution and materials handling, with processing or production costs as factors of lesser potential importance from the viewpoint of economy of operations.

All the larger companies engaged in the distribution of milk are constantly seeking ways to cut down the spread between prices paid to the farmer and prices paid by the consumer. On the one side the farmer wants more for his milk, and on the other side the consumer wants to pay less; and the dairy company is in between, doing its utmost to accede to the very understandable desires of both the producing and consuming groups.

It must not be forgotten, however, that in getting milk of proper quality and under prescribed safeguards for public health from the farmer to the city consumer, there is a chain or sequence of operations and processes, all of which must be carried out. If

L. A. VAN BOMEL

any link in a chain is broken there is, of course, no chain. And it cannot function for the purpose it was intended to serve. Hence, it is absolutely necessary for the dairy company to remain solvent, to be able to pay its bills and to continue to serve both producer and consumer.

If a dairy could make a net profit of 0.2 or 0.3 cent per quart of milk sold, it would be well satisfied, but under today's conditions the profit is only 0.1 cent per quart, and sometimes less. And under today's demands for higher wages, higher taxes and higher costs, which are often imposed on industry by those who do not visualize or comprehend the entire industrial problem, this 0.1 cent profit could easily be wiped out and converted into a red figure. Only by the most careful study and management can a dairy keep pace with the increasing demands for better service at a lower unit cost. Hence our effort is to reduce the so-called spread between the farmer and consumer.

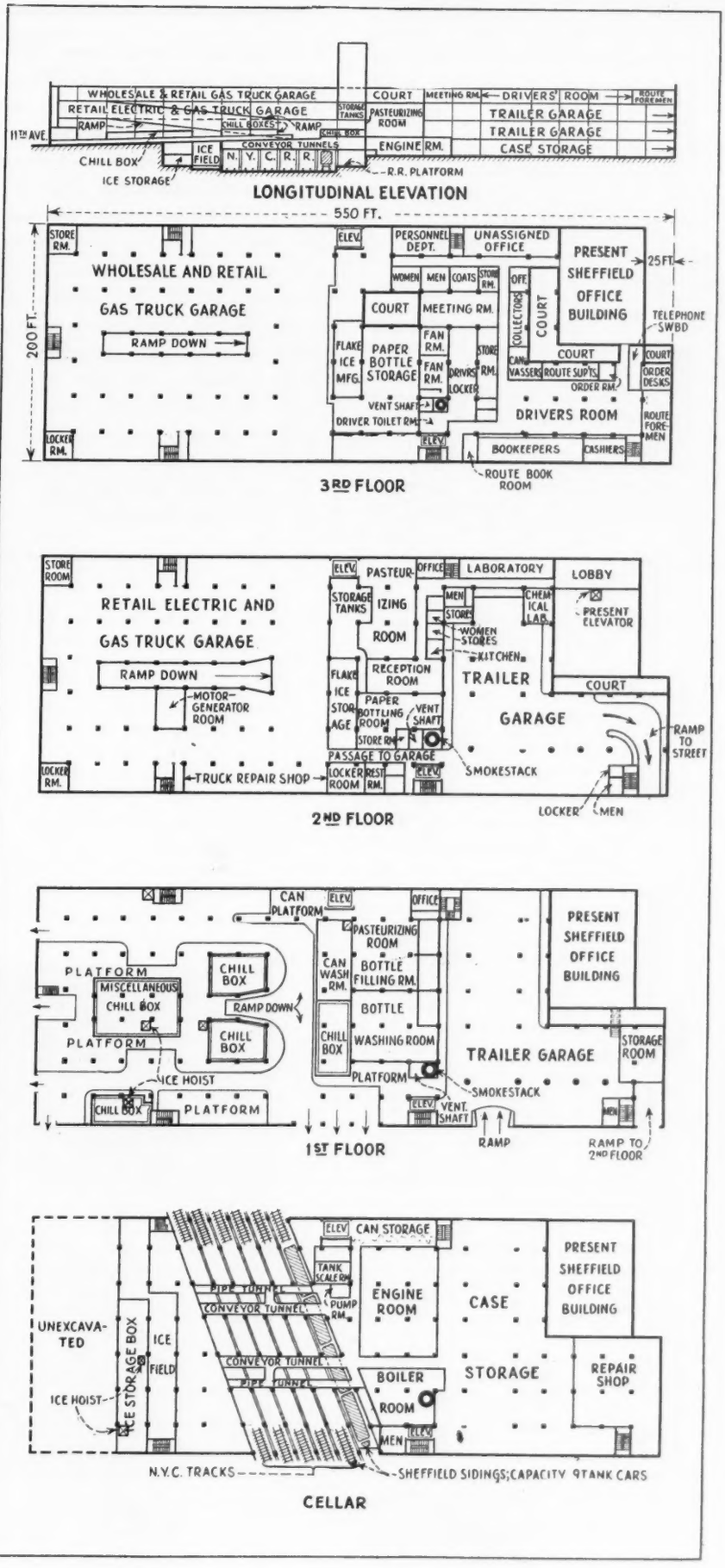
One of the problems which we face, for example, is the payment of social security taxes, which cost us $750,000 in 1937. That large sum represented our share, as employers, of the contribution to the social security funds. And it had to come out of our net profit of 0.1 cent per quart. Indeed there is no other place from which it could come.

Other problems of longer duration with which we have had to cope are of two kinds: those which are inherent to the dairy business, and those which face all industry. Of the first sort, the dairy company is most decidedly a service organization. People want their milk every day in the year, and all that they want. Any failure to supply the needs of the public causes an instant critical response. The phones begin to ring. The public in-

400,000 sq.ft. of floor space (about

sists that it must have its milk. And up to now the dairy industry has never failed to supply the milk, irrespective of the cost of doing it. No dairy ever allows itself to run out of milk. No parent is ever forced to let his children go hungry because of failure on the part of the dairy to be ready.

To maintain this standard of service when a company is large is quite different from the problem of maintaining it when the company is small. In the latter case it is possible for the small dairy to buy, for its needs, from larger dairies. But the large company must solve its problem in a different way. It must have a farm supply that is adequate for the maximum demand. Thus, if the total daily demand for all the plants of Sheffield Farms in November and December is 800,000 to



From top down, vertical elevation and floor plans for 3d, 2d, 1st floors and basement. Of special interest is basement, showing the location of New York Central Railway, which runs diagonally under building with provision for eight-car siding. Pump room on cellar floor is the focal point of entire design. By placing all milk processing equipment directly over it, piping is minimized, thereby making for considerable labor saving.

900,000 quarts, then the same farmers can normally be expected to deliver to us about 2,000,000 quarts in May and June when cows are at their maximum rate of production.

This, in turn, necessitates that we have adequate facilities to take care of the surplus above that which the public will take as fluid milk. Such facilities are found in plants located in the country where the surplus can be converted into products of the highest possible value. Like the meat packing industry, we are obligated to take all the raw material which our farmers offer us, pay as high a price for it as we can, and sell it at the best price we can get. Yet to be able to do all this we must have costly manufacturing facilities, far away from the city, about which the urban public knows practically nothing. There are many unseen costs in the dairy business, of which the foregoing is but a single example.

Other items of mounting costs that do not attract public attention are worthy of note. Under certain conditions the horse-drawn milk wagon is a very economical instrument of delivery. But the constant increase in number of traffic lights in a large city further slows down this already slow-moving vehicle, and adds materially to the cost of distribution largely because of lost driver time. Then in a city like New York there is the problem of parking a horse-wagon, which takes more space than a motor car. Carbon monoxide fumes from motor vehicles interfere with a horse's breathing and its energy, and shorten its life. These factors, plus the mounting wages of driver-salesmen, compel the adoption of motorized equipment for house-to-house delivery.

Until quite recently the original cost of motor vehicles put them at a disadvantage with respect to economy with the horse-wagon, although there were other offsetting factors. Today, however, the house-to-house motor truck can be purchased at a price but slightly above the cost of a horse and wagon. Furthermore, the economic serviceable life of the present day truck is about double that of a few years ago. The newer synthetic paints keep a vehicle presentable twice as long as before.

Twenty-five years ago a route-salesman earned $21 a week. Today he earns about $50. Every moment he spends in operating a slow-moving vehicle between the plant and the first customer on his route adds to the cost of distribution. With a motor truck today he can drive from 57th St. to the lower end of New York in almost the same length of time that was formerly required to drive a horse-wagon to 28th St. where our nearest other plant is located. Not only that, the time expended by the driver in loading and unloading his vehicle in the plant represents very high cost labor under current conditions.

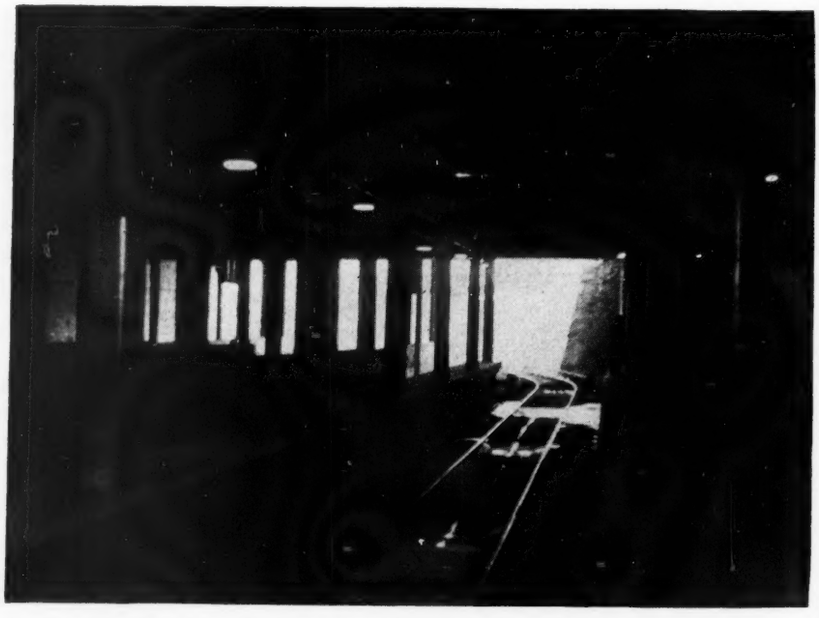
For reasons such as these we decided on a radical change from our previous operating methods—a centralized plant with completely motorized equipment and the elimination of as many smaller plants, such as 28th St., as possible. This required a design for a large plant in which the production costs should be as low as possible and in which the facilities for loading and unloading vehicles should be arranged to permit the minimum of waiting time.

Details of the plant design will be described elsewhere by a member of our engineering department, but the policy was laid down that operating costs should be kept to the irreducible minimum. To illustrate our thinking, take the matter of sanitary piping. We decided on stainless-steel piping, which, in the sizes we employ, costs about $3 per running foot. Though this is an important item of cost, the initial expense was not the reason for our lengthy study of the plant layout in order to make the piping as short as possible. On the contrary, the real reason was to cut down the daily cost of taking down, cleaning and sterilizing all the piping. Every man-hour spent in cleanup is just that much unproductive labor which, of course, must enter into the cost of our milk. By insistence on the principle of minimum piping, a design was finally achieved that represents a material saving on daily cleaning expense.

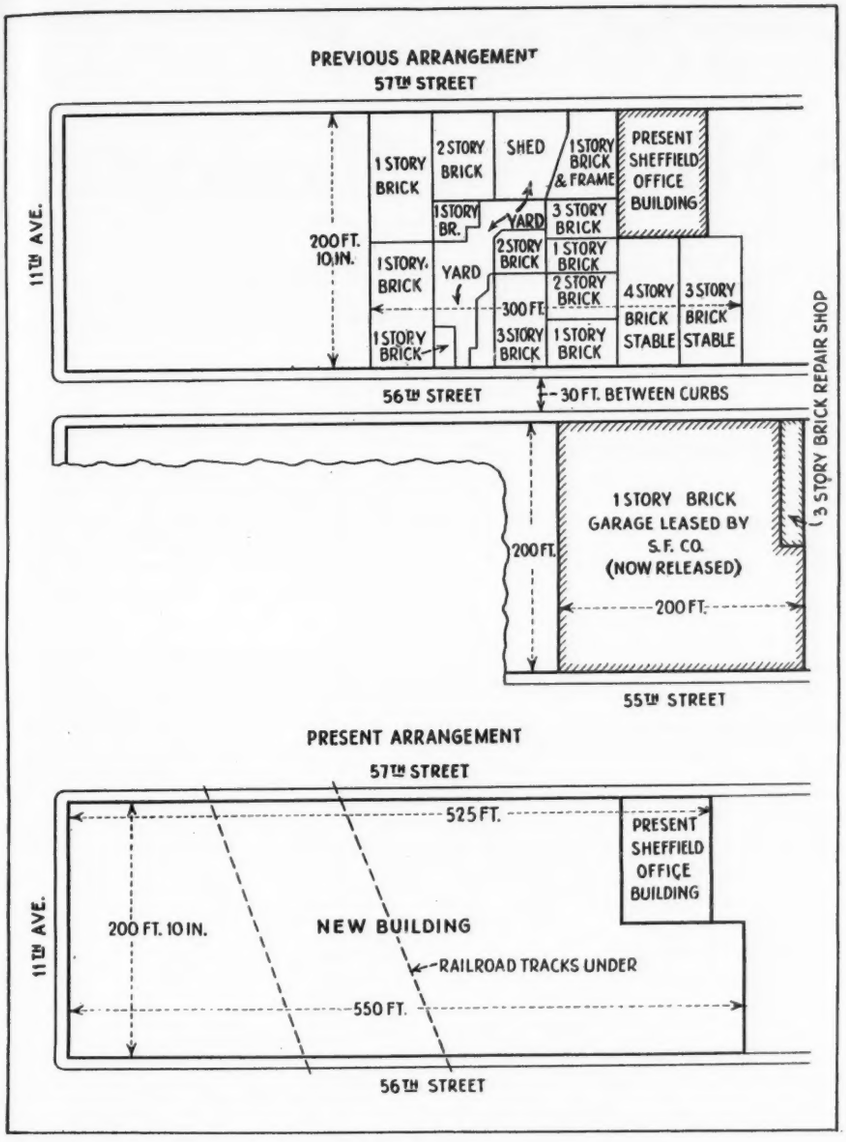
Similar policies were put into effect with respect to other plant facilities: Operations are so conducted as to hold the electric-power demand charge steady. A supplementary fleet of electric vehicles for short-haul duty was decided upon to utilize the off-peak

▶ Modernization to cut costs. That is the reason back of Sheffield's new 57th St. plant. It represents a move to keep pace with the times—to pay higher wages, to meet social security levies, to maintain a fair price to the farmer and to keep down the cost to the consumer, while at the same time protecting the slim profit margin that exists in the food business. Modernization for the same reasons is faced more or less throughout the food industries. So the story of "why, what and how," as told in this and subsequent issues of FOOD INDUSTRIES, is useful to

All Food Manufacturers and Engineers



Focal point of design in new plant is this rail siding which passes under the plant alongside the New York Central tracks. Essentially all of the milk comes into the plant in tank cars. To minimize intra-plant handling, pumping and length of piping, preliminary plans started with this siding as the one fixed point.



These diagrams show how complicated old plant was replaced by a single, well-planned structure. The many one, two and three-story buildings and a large garage across 56th St. have disappeared. Also another two-story, 15,000-sq.ft. garage at 60th St. has been released.

electric load. Boilers adequate to take care of the entire plant needs were installed just to insure that we would always have minimum rates for purchased electricity. All our vehicles are housed under one roof to avoid rental charges for outside garages—an item in the past which has proved rather costly. And all horse-drawn vehicles have been eliminated from the area served by this plant.

As to the choice of location, we were fortunate in having available a site at 57th St. where an older plant was already located. It was reasonably accessible to all parts of the city, but of greater importance was the fact that the newly constructed West Side freight branch of the New York Central Railroad went directly underneath our property. By making suitable arrangements with the railroad which were mutually beneficial, it became possible to have all our milk delivered by rail in tank cars on tracks in the basement of our new building. This in itself made a very considerable saving in cost, for truck haulage is more expensive than rail haulage. A part of our incoming milk will probably sometimes arrive by tank truck for the reason that a few of our country plants are not located on the New York Central, and we may have occasion to draw additional milk into the city when unusual demands arise. Essentially, however, all milk comes in by rail. This arrangement at 57th St. and also at our plant at Jamaica, Long Island, N.Y., gives our company the only plants east of the Hudson River and serving metropolitan New York which have this all-rail service. Back of all this lies the fact that it is far cheaper to deliver farther by retail motor-truck routes than to maintain a number of branch distributing points.

The existence of this rail siding in a deep cut in the rock underneath our plant, of necessity, has made it the focal point in the design. In order to minimize the cost of intra-plant handling, to minimize the pumping, and to carry out the policy of the shortest possible amount of piping, all preliminary plans had to start with the siding as the one fixed point. The diagram will show how the plan was ultimately worked out.

The new plant is an all grade B plant. Grade A milk for Manhattan and the Bronx and Westchester is handled at another plant at 165th St. and Webster Ave. in Bronx County and trucked to distributing points in each of those counties. This, of course, means 57th St. for New York County (Manhattan). Other milk specialties, such as cream, buttermilk, chocolate milk and the like, constituting many different items in all the various sizes of packages, are produced at a single plant which specializes in this form of manufacturing, and they are distributed to our other plants in large trucks.

The visitor to our new plant will be impressed by the relatively small amount of processing equipment used to handle the large volume of milk. Low costs go with simplicity of layout, employing large-capacity equipment. Our capacity of 30,000 qt. per hour, or about 300,000 qt. per day, gives this plant what is believed to be the largest capacity in the world. It has a floor area of 400,000 sq.ft.—about nine acres. But this large capacity is only incidental to our studied effort to cut down the spread between the farmer and the consumer. To solve this problem in the New York market and with our current volume of sales, we have found it most economical to build the big plant. By making adequate provision for installing additional equipment, should the need arise, we believe that 57th St. will alone be able to serve all our patrons in Manhattan for all time, irrespective of the number of people who will reside in New York.

In subsequent issues of FOOD INDUSTRIES *will appear detailed descriptions of the processing equipment, engineering arrangements, building features and distribution plans.*—THE EDITORS.

How "57th Street" DELIVERS MILK to Manhattan

Trucking system key to successful operation of central plant which serves area with two million population

By
A. ELSTON CUDDEBACK
and
JOHN M. BUCKLEY
Sheffield Farms, Inc., New York, N. Y.

HALF of the 400,000 sq.ft. of floor area in the new 57th St. plant of Sheffield Farms, Inc., New York, is given over to automotive purposes. Of the approximately 200,000 sq.ft. so utilized, 150,000 sq.ft. is garage or storage space and the balance, or 50,000 sq.ft., is taken up by truck loading platforms and driveways. Included in the garage are truck stock rooms, wash stands and repair shops.

Of the total garage or storage space available, approximately 50,000 sq.ft. at one end of the building is used to store motor vehicles and trailers not used in the operation of the new plant itself, leaving 100,000 sq.ft. required exclusively for that purpose.

The exclusive automotive area in the Sheffield plant is spread over three floors. As indicated in the sectional view and floor plans, the third, or top, floor is given over to the storage of those gasoline retail-route trucks which cannot be accommodated on the second floor and to the storage of the gasoline wholesale, or store-route, trucks. The second floor is utilized to store electric and gasoline retail-route trucks.

Without fully utilizing all aisle space, the third floor can accommodate 175 trucks—55 wholesale-route trucks and 120 retail-route trucks. The second floor will take care of 110 electric and 88 gasoline retail-route trucks, or 198 in all. So the combined total on both floors is 373 trucks. The portion of the first floor given over to the automotive facilities is utilized for loading and unloading the vehicles.

Movement of trucks between floors is made over two ramps, one from the third to the second floor and the other from the second to the first, or street, floor. The ramps are approximately in the center of the floors, with one ramp directly above the other. Each ramp is about 185 ft. long, which gives a moderate grade of 9 per cent. The driving surface of the ramps is 17 ft. 2 in. wide, and there are pedestrians' curbs on each side in addition.

Because both the retail and wholesale trucks must be loaded simultaneously on the ground floor, it was necessary to construct each ramp wide enough to accommodate a line of each type of truck at the same time. And because it is necessary to load many trucks at the same time to get the last truck out on time, it is necessary to form loading lines in advance.

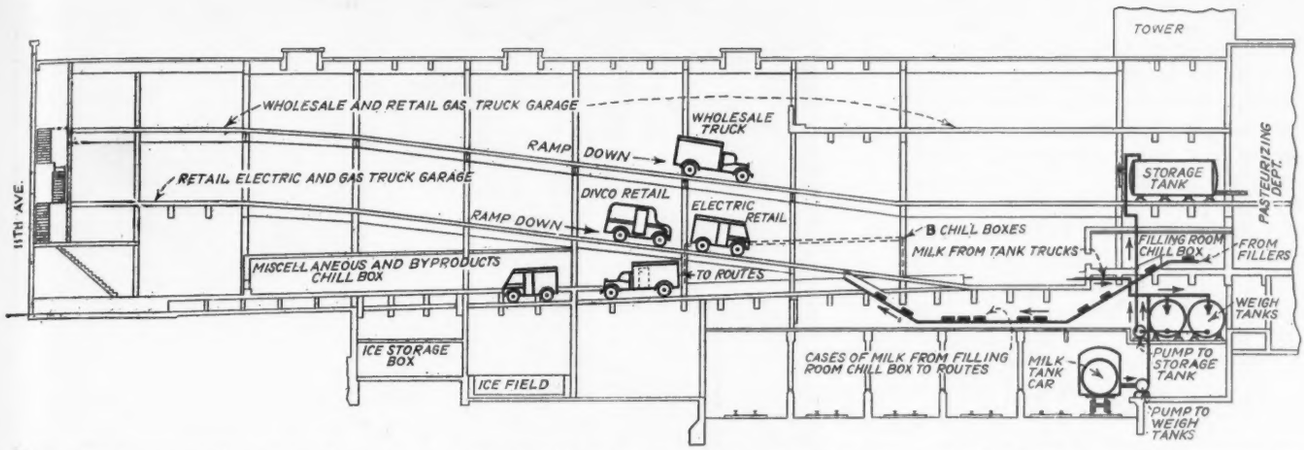
This advance line-up is arranged according to a definite plan. Each driver or salesman has assigned to him a certain truck which he operates daily. This is for the purpose of getting him to take better care of it by reason of considering the vehicle as his own; Sheffield experience has shown that this plan pays dividends in reduced maintenance cost.

Each truck is assigned a route number in addition to the company vehicle

▶ ***In Sheffield's program of modernization to cut costs, efficient motorized delivery is a keystone. The central plant is possible only through the use of trucks to conserve the non-productive time of high-paid route men. But it requires real planning to load 337 route trucks in a few hours before dawn. Moreover, for economical operation, different types of trucks must be selected for different types of routes. Then the matter of garaging this fleet of trucks is no simple matter. So there are many principles and methods discussed in this article which can be applied by***

All Food Executives and Engineers

Two plain grade B loading points on retail line. Loaders in white uniforms hand cases to truck drivers. Conveyors from chill box on right carry cases to trucks. Chain conveyor along edge of platform moves cases of empties to basement.



Londitudinal cross-section of portion of new plant, showing relative position of truck storage spaces, ramps between floors, loading platforms, chill boxes and course of milk into and out of plant. As shown diagrammatically, milk is pumped from tank cars through weigh tanks to storage tanks. Then it is pasteurized, cooled and bottled. Cases of filled bottles move by conveyor into chill box, where they are iced with flake ice. Then they are conveyed into chill boxes on loading platform, from which they are loaded into trucks. The system of loading the trucks is shown in accompanying illustrations.

Foot of ramp from second floor where it enters first, or loading, floor, showing two loading lines. Wholesale line is on left, retail, on right. (Positions have been reversed since picture was taken.)

View of retail-truck loading line, showing last of three miscellaneous-product loading points at right. Leading truck is one of 80 new Walker electrics.

number required in keeping a record of operating data. This route number is printed or painted on a small card which is attached to the inside of the windshield in such a way that the number may be seen through the glass from in front. Each truck is also assigned to a certain storage space in accordance with its route number. It is placed in this same space each day after coming in off the route.

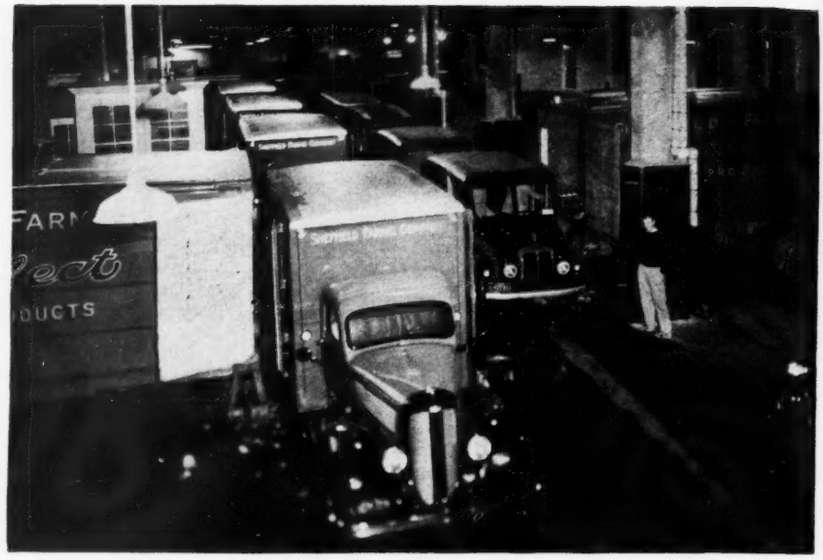
The exact arrangement of the trucks in a rectangle formed by four columns, or by a wall and two columns, is marked on a card pasted on one of the columns. This is to facilitate placing each truck exactly in its proper place. This is necessary because the trucks have to be lined up in groups of two or three, one ahead of the other, all facing an aisle, to utilize all the floor area. In practice, this exact placing of the trucks may be modified to the extent of a transposition of the two or three trucks in any given line. For example, if the truck supposed to be on the aisle in a given line should return from its route ahead of the trucks which go behind it, it will be placed farthest from the aisle. This saves considerable shifting of the trucks on the floor.

A certain portion of the second floor is set aside for the electric trucks, as shown in the floor plan. The batteries of these trucks are recharged as they stand in their places on the garage floor. Aside from placing the electrics according to route number, which is an operating function, they must also be placed in a prearranged location from a service or maintenance function. This is to permit the charging cables, which are hung from certain columns, to reach the batteries without moving the trucks.

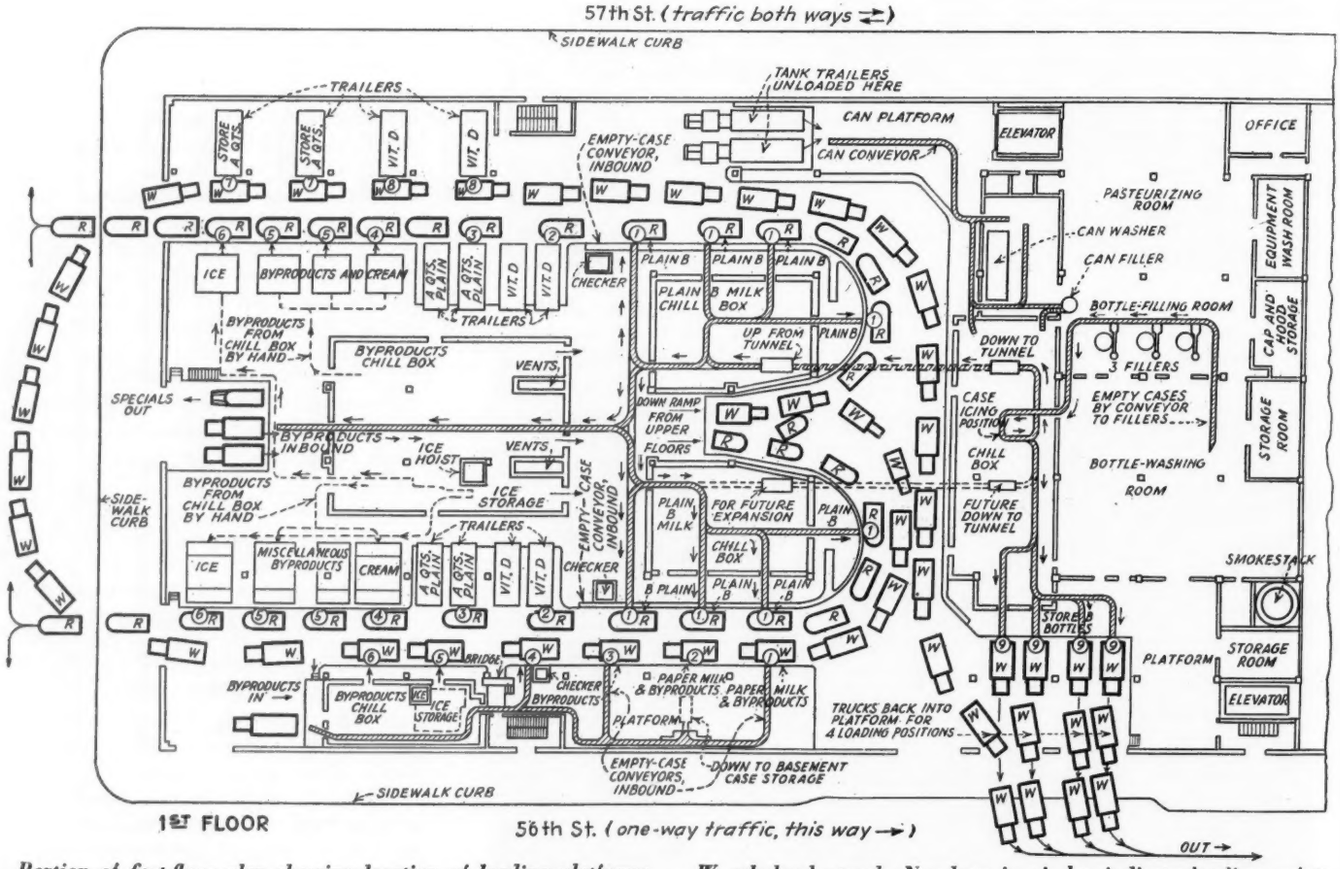
It takes longer to cover some routes than others. This may be due to the character of the deliveries or to the distance from the plant. Consequently, trucks covering those routes which are farthest from the plant are sent out first, and those serving routes near the plant, last. The trucks running the routes an intermediate distance from the plant are dispatched between the first and the last. The idea behind this arrangement is to offset the difference in the running time from the plant to the first delivery so that the routes may be covered within the hours of the working day and still give customer satisfaction. It is this general order of dispatching which determines the exact placing of the trucks on the garage floor.

The routes covered from the 57th Street Sheffield plant may be divided into two classes. These are retail routes, serving individual households, and wholesale, or store routes, on which a case or more of milk is delivered at one time. Different types of trucks are used on the different routes, with different loads. Retail routes outnumber the wholesale by a ratio of six to one. Because of the larger loads carried by the wholesale trucks, it takes longer to load them than the retail vehicles. But because of the greater number of retail routes, the loading of the retail trucks is begun ahead of the wholesale trucks, with both types finishing at approximately the same time.

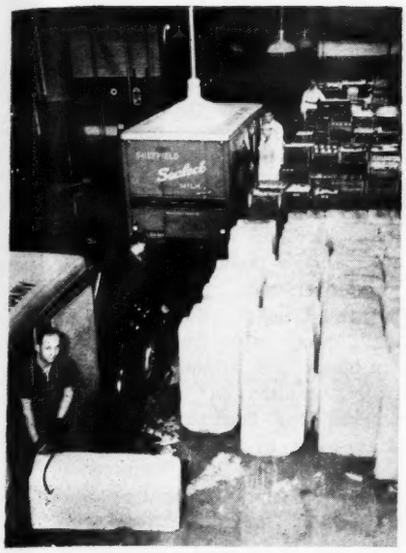
The trucks are dispatched in the order in which the drivers report.



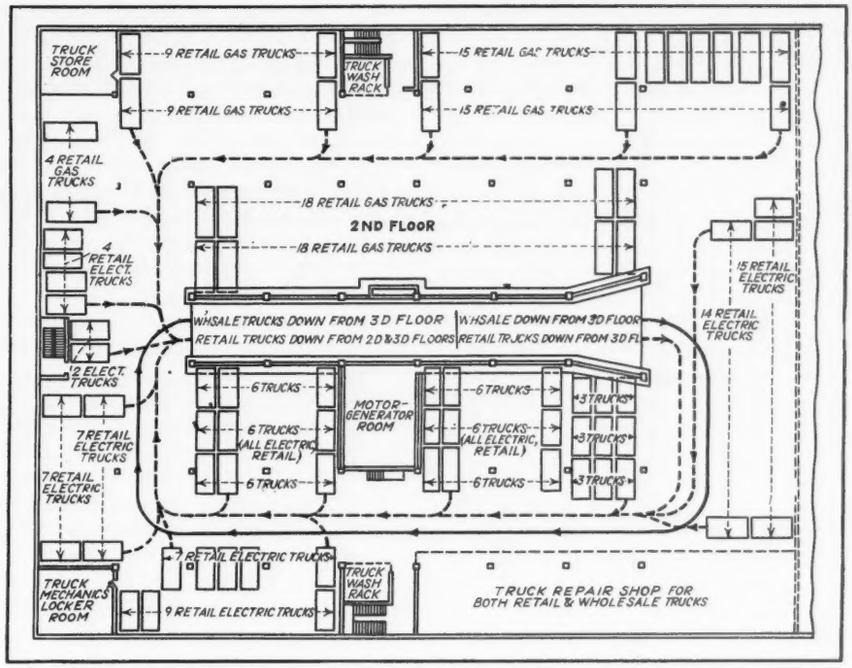
Wholesale loading line, left, and portion of retail line. Both foreground loading points are trailers with milk not processed at plant. Two rearmost wholesale trucks are receiving grade B store milk from platform chill box at rear left. Trailer in left foreground is "spotted" in recess in center platform. (Since this picture was taken, the positions of the two lines have been reversed, retail being on left and wholesale on right loading off 56th Street platform.)



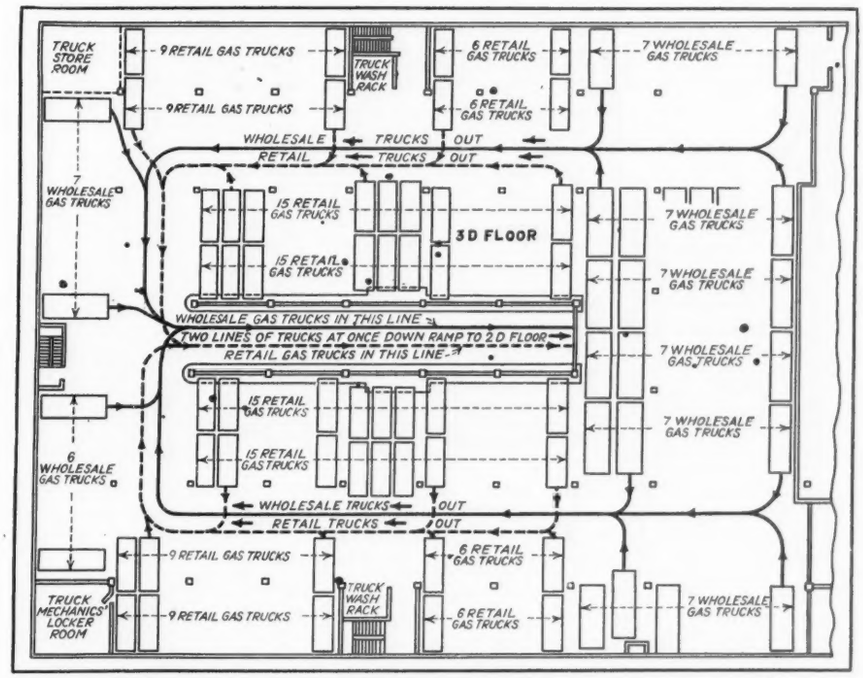
Portion of first-floor plan showing location of loading platforms and vehicle loading lines. There are two separate loading lines for retail-route trucks along sides of central platform. There is one wholesale-truck loading line. R indicates retail truck and W, wholesale truck, Numbers in circles indicate loading points for different products, as designated. Conveyors indicate course of cases of milk from fillers to chill boxes and out again to truck loading points.



Wholesale-truck ice-loading point on center platform. Beyond, three miscellaneous-products loading points. Door in background opens on Eleventh Avenue. (Retail routes now load from this platform. The wholesale trucks load from the 56th Street platform.)


TRUCK STORE ROOM
9 RETAIL GAS TRUCKS
TRUCK WASH RACK
15 RETAIL GAS TRUCKS
4 RETAIL GAS TRUCKS
18 RETAIL GAS TRUCKS
2ND FLOOR
4 RETAIL ELECT. TRUCKS
15 RETAIL ELECTRIC TRUCKS
WHSALE TRUCKS DOWN FROM 3D FLOOR
RETAIL TRUCKS DOWN FROM 2D & 3D FLOORS
14 RETAIL ELECTRIC TRUCKS
2 ELECT. TRUCKS
6 TRUCKS
MOTOR-GENERATOR ROOM
3 TRUCKS
7 RETAIL ELECTRIC TRUCKS
(ALL ELECTRIC RETAIL)
TRUCK MECHANICS' LOCKER ROOM
TRUCK REPAIR SHOP FOR BOTH RETAIL & WHOLESALE TRUCKS

Second floor, which will garage 110 electric and 88 gasoline retail-route trucks. Note how trucks from floor above line up in the upper aisle and how the gasoline trucks from second floor join these loading lines. Main truck-repair shop is on this floor.


TRUCK STORE ROOM
9 RETAIL GAS TRUCKS
TRUCK WASH RACK
6 RETAIL GAS TRUCKS
7 WHOLESALE GAS TRUCKS
WHOLESALE TRUCKS OUT
RETAIL TRUCKS OUT
7 WHOLESALE GAS TRUCKS
15 RETAIL GAS TRUCKS
3D FLOOR
WHOLESALE GAS TRUCKS IN THIS LINE
TWO LINES OF TRUCKS AT ONCE DOWN RAMP TO 2D FLOOR
RETAIL GAS TRUCKS IN THIS LINE
6 WHOLESALE GAS TRUCKS
TRUCK MECHANICS' LOCKER ROOM

Plan of that portion of the third, or top, floor given over to storage of route vehicles. Without utilizing the aisles, 55 wholesale and 120 retail trucks may be garaged. None of the trucks are placed more than two deep on an aisle, minimizing shifting on the floor. Also shown are wash racks, storeroom, locker room, ramp, and arrangement of retail and wholesale loading lines.

As the men arrive, they report by route number at the loading platform on the first floor and proceed directly to their trucks on the second or third floors. Then they pull their vehicles into the aisle ahead of them and begin to form lines which move as indicated by arrows on the accompanying second and third-floor plans. When two trucks are parked together on the floor, one ahead of the other, both facing an aisle, either of the two may be sent out first. If the driver of the rearmost vehicle arrives first, the truck ahead is shifted to permit him to get out first.

It will be noted that the trucks from the third floor form lines in the aisle on the second floor, that these lines are double, two vehicles being side by side, and that one line is reserved for retail-route trucks and the other for wholesale trucks. The reason for this arrangement is that separate loading lines must be formed because of the difference in the products to be loaded on the retail and wholesale trucks. If this were not done, confusion would result in forming the loading lines by reason of too much crisscrossing of the trucks at the foot of the ramp on the first floor.

The formation of the loading lines is controlled by a dispatcher who stands at the head, or top, of the ramp on the second floor. He sees that the trucks are in the proper order before entering the ramp leading to the first floor. Lined up in the correct order, the trucks pass down the ramp in two lines, the retails on the left and the wholesales on the right. The first truck in each line stops at the foot of the ramp just before it reaches the first floor. The following trucks close up the line behind and stand on the ramp by application of their emergency brakes.

A second truck dispatcher, or perhaps more properly a traffic regulator, stands at the foot of the ramp on the first floor. As the truck ahead vacates the first loading point in each line, he motions the leading truck in each waiting line to leave the ramp and

proceed to the loading points vacated. The other trucks on the ramp move down, stop and await their turn.

In the above manner, three continuous loading lines are maintained. It is the duty of the truck dispatcher at the head of the ramp on the second floor to see that there are no gaps in either line and that the ramp between the second and first floor is filled with trucks in each line. The traffic regulator at the foot of the ramp on the first floor is necessary because each loading line makes a turn off the ramp as it enters the first floor, and the driver of the leading wholesale truck cannot see whether the first loading point is vacant.

As the vehicles leave the ramp, the retail route trucks divide into two separate lines. One line turns to the right and the other pulls to the left and crosses over the beginning of the wholesale line.

The loading points of the two retail-route lines are practically identical. The first loading point in each line for plain grade B milk is on the rounded nose of the central platform. Farther around the platform are three additional plain B loading points. Thus, four retail-route trucks may be loaded with plain grade B milk simultaneously in each line. As this milk makes up the largest percentage of the truck load, the four loading points speed up the loading line.

The next retail-line loading points are for vitamin D and grade A milk in quarts and pints. As no vitamin D or grade A milk is processed in the 57th Street plant, these products must be brought to the premises from other Sheffield plants. Products not processed at 57th Street are scheduled to arrive before the loading operation begins. Some are unloaded directly on the center platform and others allowed to remain in the vehicles which bring them to save unloading expense. This is the case with the vitamin D and grade A milk obtained by the retail trucks at their next loading stops.

The vitamin D and grade A milk comes in closed trailers which are backed up in recesses on each side of the central platform; each recess accommodates four trailers. The tractors are disconnected and depart, usually with a load of empties, and the front ends of the trailers are supported on wooden horses. The trailers have front-end doors, and just before the loading operation begins, these doors are opened and a man stationed in each trailer. Then as each retail truck reaches the trailer, the man inside passes out to the driver the amount of milk of that kind required on his route. In the loading line shown in the first-floor plan, it will be noted that the two vitamin D trailers are placed side by side, close together. They are not unloaded simultaneously, however, because of the inability to properly position two retail trucks at the trailer doors at the same time. One vitamin D trailer is unloaded first and then the man in it is transferred to the next trailer and the operation repeated.

The next loading point is for grade A quarts and pints. These are unloaded from trailers in the same manner as the vitamin D milk.

The next retail loading points are located on the central loading platform. There are four such points for miscellaneous byproducts and ice. The byproducts include cream, butter, eggs, chocolate, certified milk, Acidolphus, buttermilk and so forth. So as not to delay the trucks at the three byproduct loading points, the requirements for each route are made up in advance of the loading from copies of the route loading sheets.

In each retail line, one of the last four stops is for ice, cakes of which are moved by hand from the ice hoist inside the large chill box. A supply of ice is set up near the edge of the platform and then cut into smaller pieces to suit the requirements of each route.

After receiving their byproducts and ice on each of the two loading lines, the retail trucks pass out of the plant onto Eleventh Avenue and head for their first delivery stops.

The retail loading operations begin about 1:30 a.m. and finish at approximately 5 a.m. While each truck is actually in the loading line for an average of ten minutes, the loading rate is about one route per minute or 60 routes per hour per line. For the two retail lines, the total is 120 retail routes per hour.

(*Turn to page 522*)

Two types of Sheffield retail trucks. Top, new Walker electric with wide rear axle to eliminate inside wheel housings; battery is inside the front deck ahead of steering post. Lower view, Dodge model showing folding door and position of the driver's seat.

Existing Cold Storage Facilities *for Quick Frozen Foods*

Part II

The present position of the ice cream manufacturer in frozen food distribution and his probable importance in this field as the frozen food industrty expands and develops

By IVAN C. MILLER

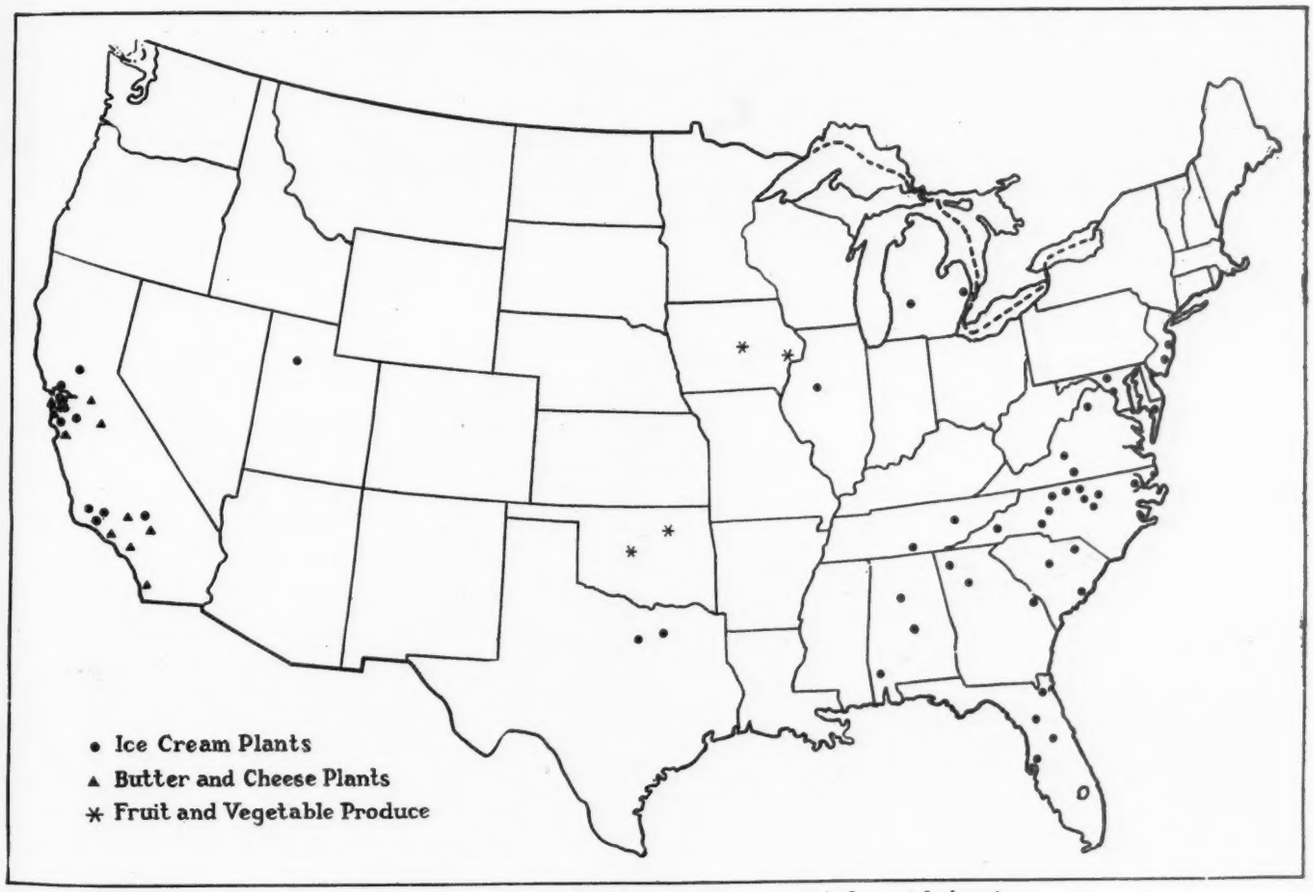
Distribution Editor, FOOD INDUSTRIES

THE FINDINGS of Donald K. Tressler, reported in FOOD INDUSTRIES, June 1938, p. 320, and also the report of M. A. Joslyn and G. L. Marsh, FOOD INDUSTRIES, July 1938, p. 379, Aug. 1938, p. 435, indicate the need of change in the method of preparation for freezing and the method of storage used for frozen vegetables, except by those companies which maintain complete quality control of products from producer to consumer. These changes will materially alter the pattern of frozen food distribution.

D. K. Tressler, at the conference on Food Preserving at Pennsylvania State College, June 1938, stated that storage temperatures of —40 deg. F. are necessary to inactivate the anzymes in frozen vegetables which have not been blanched or which have been insufficiently blanched. Especially is this true when frozen vegetables are held in storage for period of six months or longer. For short periods of holding it may be possible to employ temperatures as high as —20 deg. F. After six months vegetables in storage enter a very critical period where those improperly processed deteriorate very rapidly unless held at very low temperatures.

Blanching is a delicate operation which requires rigid quality control.

(Turn to page 504)



Map showing the type of distributors used by one of the quick freezing manufacturers to distribute frozen foods to hospitals, hotels and restaurants

POSTERS PUT

These food pages which will appear in the forthcoming October issues of the Woman's Magazines will stimulate sales when used on posters in retail stores.

TESTS MADE with the cooperation of both independent and group retail organizations to determine the promotion value of women's magazine food pages have been reported in earlier issues of FOOD INDUSTRIES. These tests have proved two facts. Retailers generally welcome this type of display poster more than other types, and cooperate in giving it an opportunity to produce. This type of poster, made by mounting reprints of the illustrated food pages of the women's magazines, produced pronounced increases when used to stimulate sales.

As a result of these tests FOOD INDUSTRIES arranged with the women's magazines to obtain advanced proofs of these pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of retailers at or about the same time the magazines reach their readers.

Mounted reprints of these foods pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

SINGLE PAGE

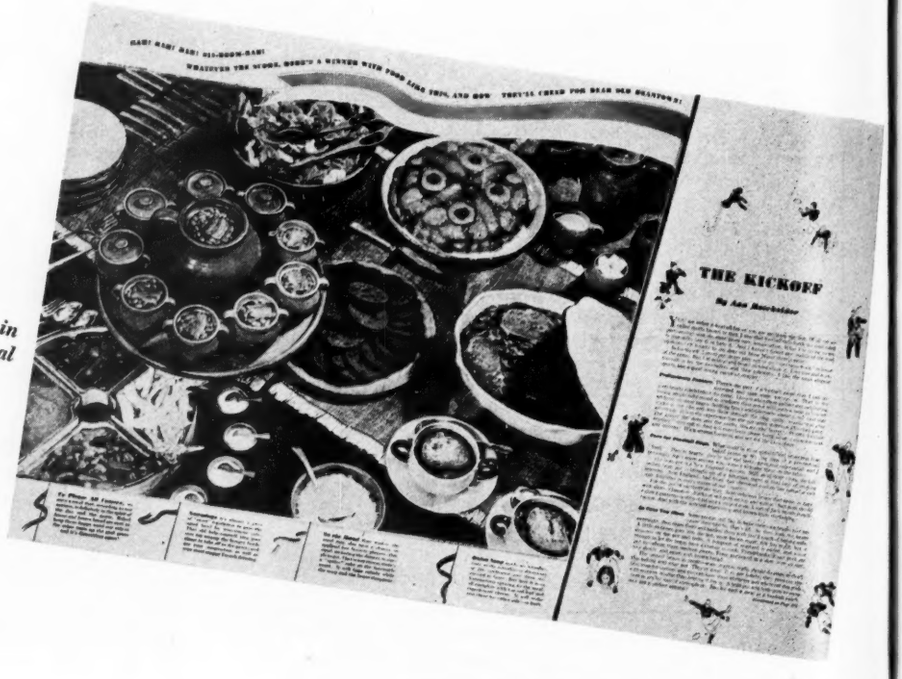
1,000 to 1,999 inclusive each	15c.
2,000 to 2,999 inclusive each	12c.
3,000 and over each	10c.

TWO-PAGE SPREAD

1,000 to 1,999 inclusive each	25c.
2,000 to 2,999 inclusive each	18c.
3,000 and over each	16c.

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products or write to the distribution editor of FOOD INDUSTRIES.

Each poster will carry the printed line "As seen in the October issue of . . . . . Magazine." The manufacturer's own selection of caption or "selling slug" such as, "Try these recipes suggested by Good Housekeeping," "Four menus with frosted foods," "Football Season Is Here," etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.



These food pages will appear in October's Ladies' Home Journal

PACKAGES ON DISPLAY

GOOD HOUSEKEEPING: Full color spread suitable for promotion of canned baked apples and prepared cake mix.

McCALL'S: Full color spread illustrating various canned products. Text furnishes recipes for dishes made with canned vegetable, chicken and turtle soup, canned ham, tomatoes, green beans, whole kernel corn, peaches, pineapple, asparagus and salmon.

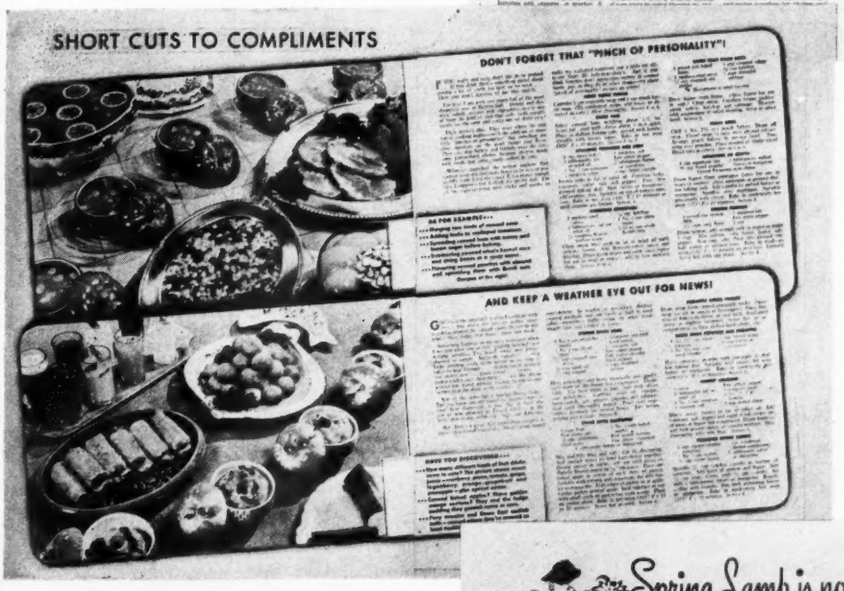
PICTORIAL REVIEW - DELINEATOR: Three-color spread, featuring lamb. Accompanying text gives recipes which require canned vegetables, and pineapple.

Desserts
EASY TO MAKE - EASY TO TAKE

October food pages of Good Housekeeping

WOMAN'S HOME COMPANION: Single page in full color suitable for promotion of fresh fruits and Roquefort or cream cheese.

LADIES' HOME JOURNAL: Full color spread suggesting fare for football days. These pages may be used to promote canned baked beans and brown bread, onion soup, cheese and relishes.


SHORT CUTS TO COMPLIMENTS
DON'T FORGET THAT "PINCH OF PERSONALITY"!
AND KEEP A WEATHER EYE OUT FOR NEWS!

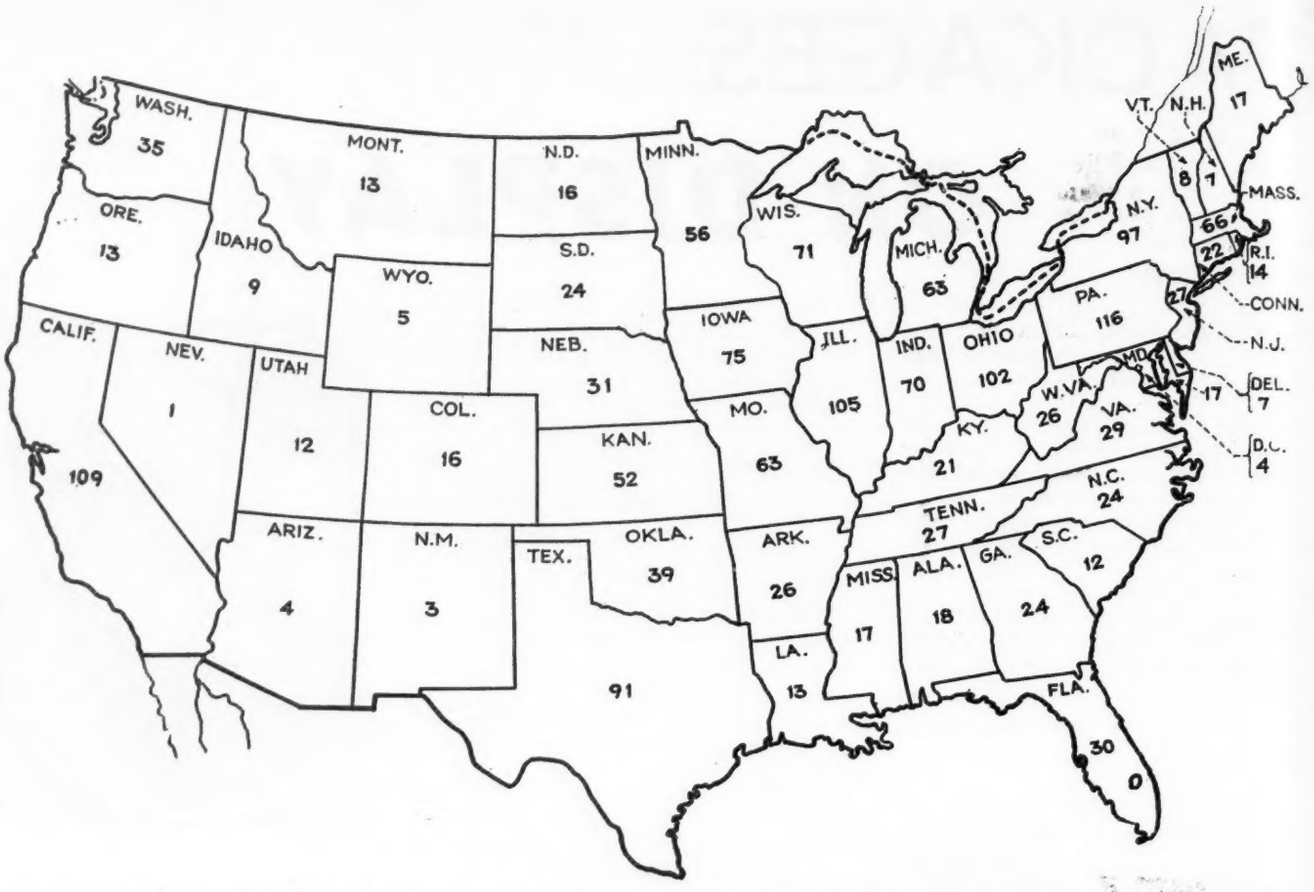
October food pages of McCall's

Spring Lamb is now Fall Lamb

Pictorial Review-Delineator's October food pages

Food Travelogue

Woman's Home Companion feature food page for October



Map showing the number of ice cream hardening rooms, by states, available for frozen food storage.

D. K. Tressler further reports that a loss of vitamin C occurs during blanching and that this loss becomes greater as the blanching period is prolonged. Over-blanching produces unsatisfactory, even unsalable food products.

For the sake of quality at the time of freezing it is reasonable to expect that vegetable freezers will employ the minimum time and temperature for blanching. This condition may in the future require much lower cold storage holding temperatures than has been the practice in the past. In fact, there is a rumor about that a remnant of last year's vegetable pack remains in storage in a condition not nearly so appealing to the consumers as at the beginning of the season.

Profitable operation of cold storage warehousing of frozen foods at temperatures as low as —20 down to —40 deg. F. introduces requirements not possessed by many of the cold storage warehouses discussed in Part I of this article in the August issue of Food Industries. The ice cream plants of the country, however, are equipped and prepared to warehouse frozen foods at the lower temperatures which may be required. This is not the only reason they appear important in warehousing quick-frozen foods. One of the maps with this article shows the number of ice cream plants in each state with hardening rooms and adequate equipment and space for the storage of quick-frozen foods at the minimum required temperatures. This chart of ice cream plants by states does not include all ice cream manufacturing plants, and but a few of the branch distributing stations.

The advantages of the ice cream plant hardening rooms are not the

(*Turn to page 523*)

The ice cream hardening room operates at capacity only during a few summer months. During the remainder of the year ample space is available for storage of frozen foods. The temperature maintained in ice cream hardening rooms is generally between —20 and —30 degrees F.

Merchandising
HINTS AND HURDLES

16-City Study Instructive

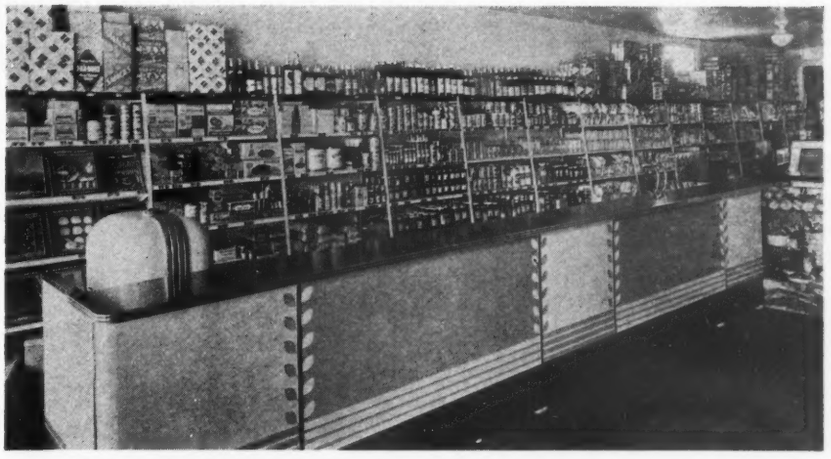
JUDGING BY THE INQUIRIES that come to FOOD INDUSTRIES' editors, there is still scant data on the food buying habits of this country and its many markets, on brand preference and on other marketing subjects. Dependable, comprehensive food market studies are scarce. The results of many of the valuable studies which have been made are the exclusive property of those companies conducting them.

Surveys aplenty have been made by various media. Food men, however, have often felt that these were conducted first to prove a point for the media and only incidentally to uncover a few market facts for the advertiser. Scripps-Howard's "Home-Inventory Study of Buying Habits and Brand Preferences of Consumers" in cities in which Scripps-Howard newspapers are syndicated, has just been released as a welcome exception to the usual media-conducted study. The studies of the Cleveland market made by Scripps-Howard Cleveland Press were discussed in *Food Industries*, July, 1937, p. 395, Scripps-Howard Cincinnati Post studies and what they indicate relative to the growth of the super-market, were discussed in *Food Industries*, Dec., 1937, p. 712. Now Scripps-Howard newspapers are releasing the results of sixteen studies conducted in various markets throughout the country where their newspapers are located. While the results may not be taken as an all-inclusive picture of the country's whole market, it is a fair index to the market situation in many of the country's largest metropolitan areas—in the South, North and Central sections.

These studies indicate the housewife's preference for competing food products in different market areas, and her brand preferences. They indicate the strength of private brands in these localities and the strength and weaknesses of different types of retail distribution, and also why.

The data for the sixteen different cities indicate that the country's food market is not homogenous. Food-buying habits and preferences vary with localities. Where these studies have been repeated from year to year, the data indicates that these markets shift, habits change, preferences vary—not all but some. Successive studies indicate trends.

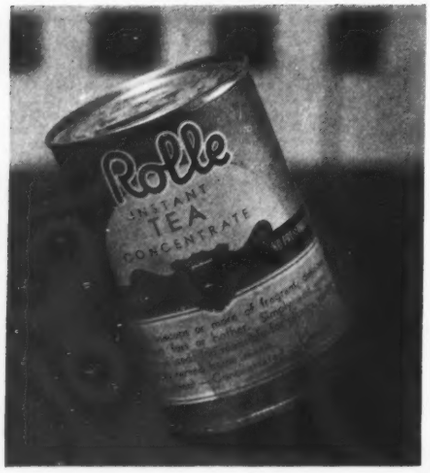
The food study should prove very helpful to manufacturers of brands sold under private labels as well as national brand manufacturers. These studies should aid the wholesaler, jobber and other distributors. They should prove instructive to retailers, especially the chains.



From time to time* Food Industries *has called attention to the trend towards the sale of ice cream through grocery stores (Food Industries, March 1938, p. 146, June 1938, p. 331). George L. Beckman's grocery in Newark, Ohio reports that the sale of 1,098 gal. of ice cream during the months of March, April and May this year compared to 120 gal. during the same three months last year, and an accompanying 10 per cent increase on all groceries, indicates that ice cream has its place in the grocery store.

Several groups of food retailers have taken revenge on competing retailers in the Oakland, Calif. district, using the Retail Food Clerks Union as a tool. Or, possibly the union is taking sides in an industry controversy. A union ruling which cannot control the hours of the family store employing no clerks, compels large retail food stores to close at 7 P. M. and to remain closed Sunday. This has caused several of the largest operators, including Andrew Williams Co., to close until the union ruling is changed. Salaries of a quarter of a million dollars a year are involved and the employments of hundreds of clerks. It is not a question of the number of hours an employee shall work, but what time of the day he shall work. It would seem that the encroachment was on the rights of the consumer. No store can long stay open late at night and on Sundays without a sales volume which reflects the buyer's choice of shopping at those hours.

New PACKAGES AND PRODUCTS



Tea Concentrate from Vegetable Juice Process

APPLYING ITS ROLLE PROCESS for making vegetable juices of a standardized fresh flavor and strength, through cold water extraction of dried tea leaves, Vegetable Juices, Inc., Chicago, has just placed an instant tea concentrate on the market. Packaged in an attractively labeled 10-fluid-ounce can, the extract contains no fibre, preservative, sweetening or coloring agent. Two teaspoonfuls make a cup of medium strength tea upon the addition of hot water. A 10-oz. can of extract concentrate plus 3 pints of water constitutes the making of iced tea in which ice cubes, sugar, milk, cream or lemon may be added, as in the case of freshly brewed tea. In color, aroma, flavor and body, it looks and tastes like tea. Extracts from high grade China, India and China-India tea blends are available.

Edible Package for Meat

PRODUCT IDENTIFICATION on every slice, improved appearance and sealed-in flavor are a few of the advantages of the new Wilson & Co. "Gelafinish" for ready-to-serve meats. First advertised extensively in connection with Wilson's "Tender Made" boneless ham, this new process is also used on other Wilson products including liver loaf, sandwich loaf, spiced ham loaf, etc. In processing "Gelafinish" and "Geladip" products, a thin transparent film of gelatin is applied over the entire surface of the product. This film becomes a part of the meat, sealing in flavor and natural juices. It also makes possible the edible labeling of products so that every slice is iden-

tified. This process also affords a new outlet for another of the company's byproducts—gelatin.

Nickel Beer May Alter Market

REVIVING A SALES PRICE reminiscent of pre-prohibition days, the Edelbrau Brewery, Inc., Brooklyn, N. Y., is now manufacturing and marketing a 7-oz. bottle of Pilsener beer which sells at retail for 5 cents. The product in its new package was introduced during July in Greater New York, through restaurants, grocery stores, delicatessens and saloons, apparently with consumer acceptance. The new 5-cent bottle has a permanent washable label fused on the glass on a portion of the bottle which is recessed to prevent the label from scarring. If the 5-cent bottle of beer obtains general acceptance, it may bring back the 5-cent glass of over-the-bar beer as well as the general use of 5-cent packaged beer. It may also place beer in a new competitive position with 5-cent soft drinks.

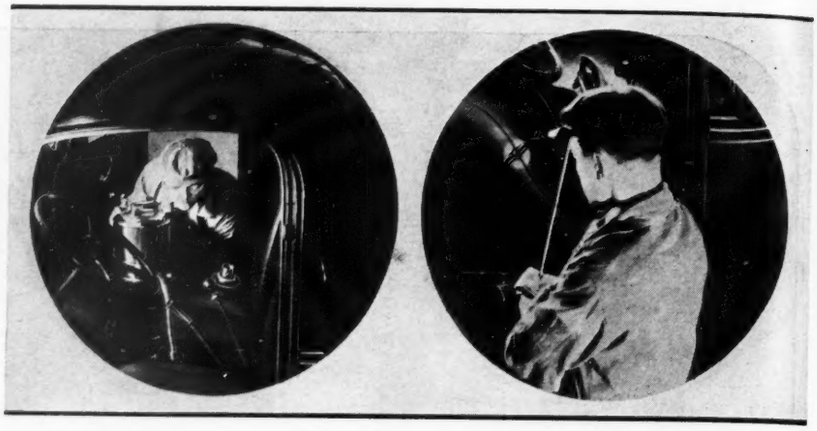
New Ginger Products

TWO NEW GINGER PRODUCTS have recently been offered to the grocery trade by Herring Gingerale Co., Jackson, Fla. One of these, "Dr. Herring's Gingerale syrup" is blended from ginger and fruit juices. With 5 oz. of carbonated water, 1 oz. of the syrup makes a beverage to be consumed as a soft drink or as a home-made mixer in highballs. The other product, "Herring's Gingamalt," a malt and ginger concentrate, makes milk palatable and digestable for children, invalids and others to whom milk is normally not acceptable.

Family of Papaya Products

A TROPICAL FRUIT of the pawpaw family, *careca papaya,* has long played an important part in the culinary art of the countries in which it is grown, both as a food and as an agent for tenderizing meats, (FOOD INDUSTRIES, Dec. 1937, p. 713, Feb. 1938, p. 85). Because the fruit is very perishable, it has not traveled far from where it is grown. Recently, however, various extracted and preserved forms of papaya have made their appearance on the market in this country. A group of these derivatives of papaya appearing on the American market are products of Papaya Development Co., Tampa, Fla. "Karika" sold through grocery stores in cans is a fruit aid drink served alone as a beverage or used in mixing drinks, highballs, cocktails, etc. "Mrs. Carrington's" papaya marmalade, papaya preserves, papaya relish, and papaya meat "tenderer" are also papaya products sold through grocery outlets. These products are also packed for the institutional trade. The Papaya Development Corp. franchises the manufacture of a 5-cent papaya carbonated beverage "Melo-Paya." Another of the company's products is "Dr. Brown's Papaya Syrup" which is sold through health food stores and drug stores. This syrup made from the papaya fruit is used as a digestive aid and as a mixer by clubs and cocktail bars.

Lubrication practices followed in the food field



Oiling the Way to LOWER Truck COSTS

THERE ARE TWO EXTREMES to which truck and commercial car operators can go in lubricating their equipment. They can change the oil and grease the chassis infrequently and use cheap inferior grades of lubricants. As experienced automotive men well know, and as the inexperienced soon learn, this practice lacks a whole lot of being economical. Good oil and grease still are cheaper than repairs or new machinery. But some operators, perhaps through having burned their fingers in the past, go to another extreme. They not only use the most expensive lubricants they can buy, but they change or apply these lubricants more frequently than necessary. Consequently, they increase their motor vehicle operating cost without gaining through reduced maintenance or longer vehicle life. So the ideal practices in truck lubrication are those which reach a happy medium.

To indicate what lubrication practices are being followed by automotive executives in the food industries, the following symposium is presented.

Uses High-Price Oil

We change the oil in the crankcase of our trucks and commercial cars every 500 miles. Our motor vehicles are equipped with oil filters and the cartridges in these filters are changed every 10,000 miles. We do not reclaim motor oil by putting it through a clarifier.

We use a high-price oil, and we put S.A.E. No. 20 in our light trucks and commercials in summer and No. 10 in winter.

It is our practice to grease the chassis of our motor vehicles every 1,000 miles, to repack front-wheel bearings every 5,000 miles and to change the grease in the transmission and differential twice a year. In regard to the grade of transmission and differential grease, we use a heavy grade in summer and a light one in winter.—L. R. OFFICE, *president, Dayton Food Products Co., Dayton, Ohio.*

Chassis Greased Weekly

The interval at which the engine oil is changed in our motor vehicles is every 1,000 miles. Oil filters are not installed on our equipment.

Medium-price oil is satisfactory. The S.A.E. grade used is No. 40 or 50 for summer and 20 for winter. The used oil is not reclaimed by clarifying.

Chassis greasing is done weekly, and front-wheel bearings are repacked each month. The grease in the transmission and differential is not changed. The grade of transmission and differential grease used is heavy in summer and light in winter.—E. W. LAMEY, *Lamey's Pure Milk Co., Mobile, Ala.*

Transmission Oil Not Changed

It is the practice of our company to drain and refill the crankcase of our trucks and commercial cars every 1,000 miles of service. Our motor vehicles are equipped with oil filters, and the cartridge in a filter is renewed every 8,000 to 10,000 miles.

An oil of a medium price gives us satisfactory service. S.A.E. 40 is the grade for summer use and S.A.E. 30 for winter in the light trucks and commercial cars. We do not reclaim used oil by passing it through a clarifier or purifier.

The frequency of greasing the chassis of our vehicles is once every 1,000 miles. The transmission and differential grease is never changed, make-up grease merely being added as required. An all-year grade grease is used in the transmission and differential.—CHAS. E. JOHNSON, *president, Hamlet Ice Co., Raleigh, N. C.*

Reclaims Engine Oil

The engine oil in our commercial cars and trucks is changed every 1,000 miles, and we have not equipped our motor vehicles with oil filters. We have found a medium-price motor oil to be satisfactory. We use S.A.E. No. 30 oil in our trucks in both summer and winter. But the engines of our commercial cars are lubricated with No. 30 in winter and No. 10 in summer.

We reclaim the oil drained from the crankcase of our motor vehicles by putting it through a Skinner clarifier.

It is our practice to grease the chassis of our equipment every 1,000 miles of operation and to repack the bearings in the front wheels every 5,000 miles. The grease in the transmission and differential is changed every season. The transmission and differential grease used is an all-year grade.—E. L. NEUBAUER, *vice-president, Field Packing Co., Owensboro, Ky.*

New DISCOVERIES AND INVENTIONS

FOOD ENGINEERING

Heat Transmission Through Wood

AN EMPIRICAL FORMULA in the metric system for calculating temperature changes through wood, gained from experience with barreled beer, is as follows:

Temperature Increase

$$W(T_2—T_1)=2.7 \times F \times 2(T_3—T_m)$$

Temperature Decrease

$$W(T_1—T_2)=2.7 \times F \times 2(T_m—T_3)$$

in which W=heat content of a full barrel per degree centigrade;

F=surface of barrel, in square meters;

T_1=initial temperature in deg. C.;

T_2=temperature, deg. C., of beer after n hours;

T_3=air temperature in deg. C.;

$T_m=0.5(T_1—T_2)$

The heat transmission factor (2.7) is obtained empirically from actual tests. Heat content of the full barrel is obtained by multiplying the weight (in Kg.) of the full barrel by 0.8, which in turn is based on the following; Specific heat of beer=1.0; specific heat of oak=0.54; specific heat of iron=0.115.

Digest from *Schweizer Brauerei-Rundschau* 48, 157, 1937 (Published in Switzerland).

To Sterilize Wrapping Materials

IN ORDER to kill all spores on wrapping materials it is necessary to heat them above a minimum of 122 deg. F. for a considerable period of time, the higher the temperature, the shorter the time. Thus 2 hours at 140 deg. and 1 hour at 149 deg. F. are equivalent. When packaging material is heated gradually from 125 to 137 deg. F., about 12 hours exposure is necessary to sterilize.

In practice, 44 hours at 190 deg. F. is used. This is the maximum safe air temperature. Stacks of materials undergoing treatment should not be larger than 15 cubic feet with ample air space around each stack.

The method has been used successfully for wrapped meats.

Digest from "Eleventh Annual Report, Council for Scientific and Industrial Research," p. 56, 1937 (Published in Australia).

METHODS OF PRESERVATION

Glycerine as a Preservative

ANYONE INTERESTED in learning of the possibilities of glycerine as a preservative for foods will find a brief résumé of the subject in "Glycerine Facts" published by Glycerine Producer's Association, Suite 2234, 11 West 42d St., New York. The following uses are cited:

For liquid freezing medium, consisting of 20 to 40 per cent glycerine, 20 to 40 per cent ethyl alcohol, and 25 to 45 per cent water. It can be cooled to —30 deg. C. without freezing. (U. S. Patent 2,102,506.)

For preserving egg contents by mixing with 2½ to 15 per cent of glycerine and vacuum-evaporating to not more than 35 per cent water content. (U. S. Patent 1,639,549.)

For a fruit preservative: 1 gal. glycerine to 4,025 gal. water.

Other minor uses are given.

Why Gas Storage is Effective

TESTS of the rate of growth of bacteria on beef at 30.2 deg. F in an atmosphere containing 10 per cent carbon dioxide, indicate that there seems to be a critical moisture content of the beef muscle, for each species of organism tested, below which growth cannot occur. This critical moisture content is higher in air than in an atmosphere containing 10 per cent CO_2.

Digest from "Eleventh Annual Report, Council for Scientific and Industrial Research," p. 55, 1937 (Published in Australia).

BAKERY PRODUCTS

Lactic Acid in Bread Making

IN MAKING BREAD from acidified dough a seasoning material is used which is itself an over-acidified dough. In this improved method, a dough is first prepared with yeast and an acidifying agent comprising commercial lactic acid or a product made therefrom. Separately, a sour dough is made at a high fermentation temperature which is maintained longer than the usual time. Without regard to the virulence of the yeasts, this dough is prepared with a sour-dough organism which, under the comparatively extreme time and temperature conditions, forms an excessively sour dough. This is the seasoning preparation which is added, in such proportion as to give the desired flavor, to the ordinary yeast dough.

If preferred, a very thin sour dough may be made up, over acidified in the prescribed manner, and used as the seasoning agent.

Again, if convenience calls for such a modification, the excessively sour dough can be thinned to such a liquid consistency that it can be used as the make-up liquid for the dough to be seasoned. All these embodiments of the essential idea are disclosed in the patented invention (German Patent 656,086, granted Jan. 28, 1938, to Wilhelm Schroeder, Dortmund, Germany).

BEVERAGES

To Remove Beer Stone from Aluminum

A METHOD of cleaning beer stone from aluminum is given in Austrian patent No. 151,293.

Glycerine 50 per cent by volume.. 8 liters

Commercial H_2SO_4.....12 liters

$(NH_4)_2SO_4$.....2.4 kilograms

Urea (technical).....0.5 "

Starch .....0.25 kilograms } in suspension
or Lime....0.2 " }

Mix the last three ingredients into the acid (to act as corrosion inhibitors) before adding to the glycerine. If desired to use in paste form, add powdered silica or clay.

(Turn to page 526)

The PLANT NOTEBOOK

Paraffining of Food Cartons and Containers

The paraffining of food cartons and containers has long been recognized as an important operation, and it gives promise of becoming more so. Cans, cups, milk bottle caps, pails and cartons are regular everyday items, and there is no question but that we shall see further developments along this line. There are differences, however, in the manner in which this job is done in different places. For simple items like milk-bottle caps, an ordinary paraffin bath, using electrical heating units sufficient to bring the paraffin solution to around 250 deg. F., together with a feeding mechanism of blanket type, is sometimes used, and does a very good job.

An old standby in the field of paraffining butter carton blanks and similar work is a machine using carrier belts to take carton blanks from three separate hoppers, carry them through a paraffin tank, out again and through felt-covered equalizing rolls, and thence to a tank containing cold water. As the paraffin-coated blanks pass through the felt-covered rolls, the excess paraffin is removed and drains back into the tank. The action of the rolls is such as to make uniform the coating of paraffin that remains. Then, as the blanks enter into contact with the cold water, a gloss is imparted. Running water is used in order that low temperature may be maintained. The under-water rollers through which the carton blanks pass are coated with copper, and as the cartons emerge they are run between rubber-covered rollers which remove excess water. Machines of this general type are made up for application to various kinds of products, by firms specializing in such equipment.

Another interesting paraffining process is that of spraying the material. With so many kinds of materials being successfully sprayed in connection with heat, it was inevitable that a process for spraying paraffin would develop. Machines of this general type are in a large measure adaptations of similar machines used for spraying paints and finishing materials. After all, what is needed on food containers is a thorough and uniform coating of material that will make them moisture-proof for a time, and also sanitary, and this can be accomplished by the spraying process. —J. E. HYLER, *Peoria, Ill.*

Fig. 2—Showing how the synthetic rubber tubing is threaded over the previously shaped metal grid rods.

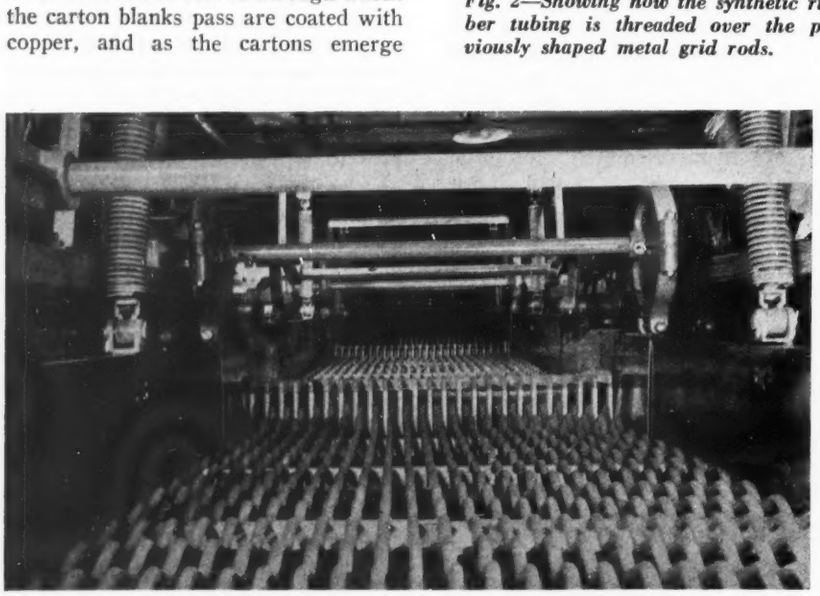


Fig. 1—The grids of this fruit washing machine are covered with synthetic rubber which withstands the corrosive action of the washing solutions.

One Way to Stop Corrosion

Corrosive conditions in some processing equipment are extremely severe and, with such equipment, it is often a problem to select materials of construction that will stand up under the service conditions which the machinery is designed to meet.

An example of such equipment is the fruit washing machine made by the Fruit Packers Supply & Equipment Co. This machine (see Fig. 1) consists of a grid actuated by eccentrics so that it moves forward through a tank of washing solution. Fruit is fed onto the grid at one end, and the forward motion causes it to travel to the opposite end, where it is deposited on a lattice-like step that is always in mesh with the grid.

In passing through the washing solutions, the grids must withstand the corrosion action of various solutions of soda ash, sodium silicate, hydrochloric acid, light mineral oils, and several types of wetting agents. The rate of corrosion is speeded up by heat and by the thorough aeration occurring during the first washing operation.

After trying corrosion-resistant metal without success, the machine maker tried out a grind made of rods of $\frac{5}{8}$ in. cold rolled steel covered with synthetic rubber tubes sealed at each end with plugs of the same material. In Fig. 2, is shown the method of placing the tubing over the rods of steel, which were previously bent to the desired shape. The tubing used was of "Neoprene," a synthetic rubber made by E. I. du Pont de Nemours & Co., which resists the action of various chemicals, including oils, whereas natural rubber is attacked by at least some of these agents.

Of course, when the rods were covered with the tubing, they could not be welded in place, as would be the case with an all metal grid. So they were mounted between blocks of Eastern maple, cut and curved to fit the covered rods and held together by a tie rod of $\frac{1}{2}$ in. Monel metal. These tie rods extend through the wooden sides of the grid, and so are entirely covered and protected in this way from corrosion.

Several machines equipped in this way were in operation all last season and the tubing stood up in service without being affected by the washing solutions.—ALLEN F. CLARK, *Wilmington, Del.*

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Metal Detector

ILLINOIS TESTING LABORATORIES, INC., 420 No. La Salle St., Chicago, Ill., is now offering a device for detecting the presence of tramp iron or steel in food products. This device is called "Alnor Forewarn" detector equipment. It consists of a search coil, an amplifier, and supervisory signals. Amplifier and signals may be made an integral part of the coil system, or they may be installed at a remote location. Detection is brought about by passing the food packages through the coil, when the presence of iron or steel is made known through the amplifier and signal.

Push-Button Hoist Control

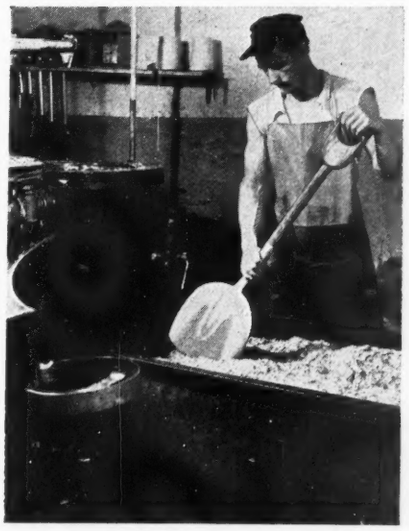
To SIMPLIFY the operation of floor-operated hoists and cranes, Harnischfeger Corp., 4400 West National Ave., Milwaukee, Wis., has developed a push-button control. This is a variable speed control, having five control steps. The control is so designed that buttons are grouped in a case, the arrangement of elements depending on the number of motions controlled. In this way, it is possible to have the control for a single speed hoist together with a variable speed trolley or bridge, in one push-button case. This can all be suspended from the hoist by a multi-conductor cable, and thus eliminates a variety of dangling ropes.

Cellophane Cutter

MCCLINTOCK DISPLAY CO., 3044 Riverside Drive, Los Angeles, Calif., has developed a "Celowrap" cutter for dispensing cellophane in sheets from rolls. This machine is suitable for use in small manufacturing establishments and in retail stores.

Corrosion-Proof Shovels

WOOD SHOVEL & TOOL CO., Piqua, Ohio, is making a line of aluminum shovels for use in meat packing plants, breweries, and other food manufacturing plants. These shovels



Sanitary aluminum shovel

are non-corrosive, easily cleaned in boiling water to keep them sanitary, light in weight, and are of closed back construction to prevent material from lodging.

Heavy Duty Push Buttons

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa., is making Type HD push buttons for a.c. and d.c. control circuits. These are designed for heavy duty service where dependability is of first importance. There are eight different units, including lamp receptacle and rotary selector switches, which may be grouped together in desired combinations to meet almost any application requirement. These units are suitable for built-in control or for panel mounting.

Circular Knife Grind

SAMUEL C. ROGERS & CO., 191 Dutton Ave., Buffalo, N. Y., have developed the type CC-3 grinder for slitter knives and all circular disks (solid or split) from 2 to 20 in. diameters, in any trickness, single or double bevel, flat face. In this machine the knife is motor driven through a variable speed V-belt drive, adjustable to suit diameter of knife. The grinding wheel is driven by a separate motor and is adjustably mounted so that it can be used on knives from 2 to 20 in. in diameter. A triple slide provides adjustments to meet all requirements of circular grinding, whether single or double bevel of any degree. A motor-driven wet grinding attachment with splash guards is provided.

Salt Dispenser

INTERNATIONAL SALT CO., INC., Scranton, Pa., has developed a new salt tablet dispenser for use in factories where salt tablets are made available to workers to guard them against the effects of hot working conditions. This dispenser has a screw top, and a knob at the bottom which may be turned in either direction to release the salt. A transparent window at the front is provided to show when the supply of tablets is running low. Grooves at the back make it possible to slide the dispenser on fasteners to attach it to water cooler. The device is made of molded plastic.

Salt dispenser

Just Off The Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

Chlorination Equipment—"De-Sliming Condensers by W. B. Periodic Chlorination" is the title of an 8-page technical bulletin issued by Specialties Engineering & Service Co., Inc., Hoboken, N. J.

Crushing Equipment — A 2-roll crusher feeder for feeding ear-corn and small grains to pulverizing mills is described in a 4-page bulletin of Nickle Engineering Works, Saginaw, Mich.

Meat Packing Equipment—Machines and accessories for sausage factories and packing houses are described and specified in a 48-page catalog issued by Berg-Michel Machinery & Supply Co., 4040 S. Princeton Ave., Chicago, Ill.

Plant Accessories and Supplies

Electrical Equipment—The General Electric Co., Schenectady, N. Y., has issued the following bulletins: GEA-1929A, Bulletin describing 21 low speed drives that have been modernized with G.E. gear-motors; Bulletin GEA-2742, describing Pyranol capacitors for low voltage industrial applications; GEA-8418, describing a.c. magnetic switch low-voltage starters for induction motors; GEA-432C, describing direct current generators and exciters, 125 or 250 volt, 3 to 150 kw.; GEA-1283A, describing cam operated master switches for a.c. or d.c. control circuits; GEA-1842, describing the application of industrial test instruments.

Factory Cleaning—Vacuum cleaning equipment for cleaning buildings and equipment in industrial plants, are described in an 8-page illustrated bulletin of Invincible Vacuum Cleaner Mfg. Co., Dover, Ohio.

Industrial Electric Trucks—In General Catalog No. 50, the Baker-Raulang Co., Cleveland, Ohio, describes and illustrates its general line of industrial electric trucks and tractors for factory service.

Lubrication—In Bulletin G, the Bijur Lubricating Corp., Long Island City, N. Y., shows applications of automatic lubricating systems to various types of industrial equipment.

Paints—The use of color in paint as a means to better, faster and more pleasant work, is the subject of a 16-page illustrated bulletin of the Sky-bryte Co., Cleveland, Ohio.

Safety Equipment—A line of goggles, shields, helmets, respirators and other safety equipment, with list prices, is the subject of a 34-page illustrated catalog, issued by Willson Products, Inc., 377 Thorn St., Reading, Pa.

Stream Traps—American District Steam Co., North Tonawanda, N. Y., in a 4-page illustrated bulletin, No. 35-86, gives details of the construction and the installation hook-ups of its vertical float type steam traps.

Work Clothing—Washable service uniforms of all types for men and women are described and illustrated in a 48-page catalog of Angelica Jacket Co., 1419 Olive St., St. Louis, Mo.

Packaging

Wrapping Machine—Model LP-2, a machine for wrapping pops and similar confections, is described in a recent bulletin of Package Machinery Co., Springfield, Mass.

Control Equipment

Control Instruments—The Bristol Co., Waterbury, Conn., has published Bulletin No. 462, describing temperature recorders and controllers for use with industrial ovens and furnaces. Also included in this bulletin are descriptions of pneumatic and electric control valves and of "Pyrotrol," a device for automatically lighting gas-fired ovens and for protection against explosion caused by pilot light failures.

Control Instruments—For use in hazardous atmospheres, Brown Instrument Co., Philadelphia, Pa., describes, in a recent bulletin, pneumatic remote equipment for the transmission of measurement and control.

Flowmeter—In Bulletin 102, Fischer & Porter Co., 110 W. Penn St., Germantown, Philadelphia, Pa., describes the latest developments in "Rotameter" flowmeters and the applications of these instruments in many industries.

Flowmeters—Instruments for the measurement of flow of steam, water, oil and other fluids are shown in a 4-page folder discussing economies in power production, issued by The Brown Instrument Co., Philadelphia, Pa.

Laboratory Equipment

Laboratory Filters—National Surgical Supply Co., 458 Broadway, New York, N. Y., has issued a bulletin, No. 100, describing filters for germ-proofing and sterilizing in the laboratory.

Sanitation and Sterilization

Insecticides—The use of chlorpicrin, under the trade name "Larvacide," in protecting food products and other materials from insect infestation, is described in an article by Conrad C. Johnson, reprinted from Chemical Industries, March 1937, by Innis, Speiden & Co., 117 Liberty St., New York, N. Y.

Milk Equipment Cleaner—K-Solv, a cleaner for removing milkstone and for lowering bacteria count, is described in a folder published by Magnus Chemical Co., 215 South Ave., Garwood, N. J.

Mold and Rope Inhibitor—"Mycoban" a chemical treatment for inhibiting the growth of mold and of "rope" infection in bread and other products, is described in an illustrated bulletin issued by National Ammonia Division, E. I. duPont de Nemours & Co., Inc., Frankfort P. O., Philadelphia, Pa.

Materials of Construction

Insulation—A 44-page booklet entitled "Fundamentals of Good Refrigerator Insulation," published by Dry-Zero Corp., Merchandise Mart, Chicago, Ill., discusses the basic problems involved in the insulation of refrigerated containers for trucks and railroad cars.

Corrosion Resistant Metal—400 practical applications of nickel, Monel metal and Inconel alloy, under corrosive conditions, are shown in tabular form in a 26-page bulletin issued by International Nickel Co., 67 Wall St., New York, N. Y.

News

General News—Business Trends—Men, Jobs and Companies

Government Developing Grades for Frozen Foods

Government grades for frozen foods, something which many believe needed to protect the industry from purveyors of inferior quality, apparently are in the offing. The Bureau of Agricultural Economics is now carrying on experiments to determine official grades for frozen peas, and it is expected that grades for other fruits and vegetables will be developed rapidly.

When the experimental work on peas is completed, the grades developed will be issued in tentative form to permit the industry to offer constructive criticism. And the first grades established probably will be revised after a time in keeping with the dictates of experience.

Standards Committee Appointed by Wallace

Definitions and standards for foods will be formulated under the new food law by a committee appointed on August 13 by Secretary Wallace. Standards both of identity and quality, including fill of container, will be formed by this committee after consideration of the data, analytical and inspectional, deemed necessary to support them. The committee will meet in the Food & Drug Administration offices at Washington at intervals and review the data which has been assembled, draft tentative standards and then, upon conclusion of public hearings, make its final recommendations. Under the new act, the committee's definitions and standards, when promulgated by the Secretary, will have the full force and effect of law.

In setting up this standards committee, it was the intention of the Food & Drug Administration to perpetuate the food standard committee which has functioned in promulgating administrative standards for the past 25 years. This committee has consisted of representatives from the Association of Official Agricultural Chemists, the Association of Dairy Food & Drug Officials of the United States and the U. S. Department of Agriculture. So the new committee, with six members, includes two representatives from each of the above bodies. These members are: W. B. White, chief, Food Division (F&DA); W. S. Frisbie, chief, Division of State Cooperation (F&DA); C. D. Howard, director and chief, Division of Chemistry and Sanitation, State Board of Health, Concord, N. H. (AOAC); Guy G. Frary, state chemist, Vermillion, S. D. (AOAC); J. J. Taylor, state chemist, Department of Agriculture, Tallahassee, Fla. (ADFDO); and Mrs. F. C. Dugan, director, Bureau of Foods, Drugs and Hotels, State Board of Health, Louisville, Ky. (ADFDO).

W. B. WHITE
Member of food standards committee

Lowers Mold Count For Tomato Juice

Mold standards for tomato juice have been tightened by the Food and Drug Administration. Under the new standards, tomato juice showing mold filaments in more than 25 per cent of the fields is an adulterated article subject to action by the F&DA. For the past two years, the standard has been 35 per cent. No change has been made in the mold count standard for other tomato products, this remaining at 50 per cent.

The reason for setting the new standard for tomato juice, according to W. G. Campbell, chief of F&DA, is that under present-day methods of production, the finished tomato juice will show mold counts materially less than 35 if proper care is taken in the manufacturing operations.

Pours Cold Water On Frozen Food Profits

Those who process, store and distribute frozen foods without thorough knowledge of the technicalities involved had better keep a close watch on their pocketbooks. That is what Ivan C. Miller, distribution editor of FOOD INDUSTRIES, told National Food Distributors Association in Cleveland on August 19. Frozen foods are entering a period of development which threatens the profits of those who do not know their business, he warned.

The expansion of the frozen food industry will not be as great as many predict because of balancing factors, Mr. Miller predicted. One of these factors will be improvement in canning, which will narrow the gap in flavor and quality between canned fruits and vegetables and the fresh or frozen products. Still another factor which may play an important role in curbing the advances of frozen foods is the little known industry, tank agriculture or soilless farming.

2,500 Locker Plants

One of the outstanding recent developments in the field of food distribution is the rapid expansion in the use of refrigerated locker plants. That is the conclusion of L. B. Mann, who recently completed a study for the Farm Credit Administration.

There are now in operation approximately 2,500 plants, containing 850,000 lockers, each of which has an annual storage volume of 500 lb. or more, Mr. Mann estimated. New plants are being constructed at the rate of about 50 a month. Nearly all sections of the country now have some of these plants, although the greatest number are found in the Western and mid-Western states.

Farmers and townspeople rent lockers at a cost of from $10 to $12 a year. Some lockers give what may be called "limited" service and others, "complete" service. The limited-service lockers provide cold storage service only. Complete-service plants resemble small, modern packing plants, and they do butchering, chilling, cutting, wrapping, grinding, sharp-freezing, curing, smoking, lard rendering and cold storage of meat. They also store fruits and vegetables.

1939 Farm Program Announced by AAA

Taking the lowest figure permissible under the new farm law, the AAA has set the wheat acreage for 1939 at 55,000,000 acres, a reduction of about 30 per cent from the acreage actually planted for the 1938 crop. AAA has also announced as part of its 1939 farm program that next year's cotton acreage will approximate the 27,500,000 acres allotted for 1938.

Acreage allotments for corn, rice, tobacco and other commodities will be made for 1939. But these allotments will not be determined until 1938 production is known more accurately. The AAA reports, however, that on the basis of the current production estimate for corn, the 1939 corn acreage allotment will not be greatly different from that for 1938.

Aside from the crop allotment figures, the new farm program is similar in most respects to that of 1938. Here are the essential points of the program: (1) National allotments for soil-depleting crops and a national objective for soil-building crops and practices. (2) Individual soil-depleting crop allotments for wheat, corn, cotton, rice, potatoes and tobacco. It has not yet been determined whether the special allotments established for peanuts last year will be discontinued, nor has a decision been reached as to special provisions for commercial vegetable crops. (3) Payment to farmers for keeping within soil-depleting crop allotments and for attaining soil-building goals. (4) Crop classifications and soil-building practices similar to those approved in 1938. (5) Provision that land used for home gardens may be excluded in calculating soil-depeting crops for farms. This is a new provision, suggested as a means of increasing the living standards for many farm families. (6) Continuation of efforts to restore to grass, land unsuited for crops in the Great Plains area.

The 1939 program, however, is dependent upon action by Congress to furnish funds, as the appropriation has not been made, except for $212,000,000 for price-adjusting payments.

Milk Marketing Control Proposed for New York

Dairy companies handling milk in the metropolitan New York area apparently are to be put again under a milk marketing program. The State of New York made a noble attempt to stabilize the industry at prices which would give a profit to producers, but the program broke down under the weight of enforcement difficulties. Now the Department of Agriculture has stepped in with a federal program. This needs only a two-thirds support of the dairymen of the seven states supplying milk to New York to put it into effect. And since the agreement would increase the price to producers, it is not unlikely that they will support it. Preliminary reports, in fact, indicate strong support.

The agreement provides for minimum prices to producers for each class of milk. The price for Class I, or fluid milk, varies with the price of butter on the New York market. For Class I milk in the basic 201–210 mile zone, the price is put at $2.65 per hundredweight for milk if the price of butter is between 30 and 39.9 cents a pound for the months August through March, and $2.20 per hundredweight if the price of butter is between 25 and 34.9 cents a pound, for the months of April through July. From this base point, the price moves up another 20 cents if butter goes above 39.9 cents and 20 cents additional each time there is an increase of 5 cents in the butter price.

Testimony brought out in hearings indicated that producers were receiving early in the summer from $1.30 to $1.70 a hundredweight, and that since then the price has fallen as low as $1.

Food Law Regulation

Regulations pertaining to the administration and enforcement of the recently enacted Food, Drug and Cosmetic Act have been issued by the Department of Agriculture. While these cover sections of the Act which went into effect June 25 and pertain principally to drugs and cosmetics, one of them has a bearing on foods. This is a regulation under Sec. 702 (b). It covers the taking of official samples of a product and specifies, among other things, that the sample shall be twice the quantity estimated to be sufficient, there being certain horse-sense exceptions to this rule. And in addition to the double quantity, the officer of the Department of Agriculture taking the sample shall collect such further amount as needed for use as exhibits in the trial of a case. After the Food & Drug Administration has finished with the sample, a part of it, if any remains available, shall be provided for analysis, upon written request, by any person named on the label of the article or the owner thereof.

CAPITAL VIEWS

FUMIGATION—Control of the Japanese beetle requires fumigation of certain commodities moving out of quarantine territory. Recent administrative restrictions provide that dry refrigerator cars filled with onions are expected to be fumigated with methyl bromide, using 2 lb. of the chemical per 1,000 cu.ft. of total space in the car for a period of 2 hours, with the inside temperature not less than 70 deg. F. This standard of fumigation is more or less representative of required effective practice for various commodities under quarantine.

FEWER "YES MEN"—Washington is making a great point of the results in primary elections. Business spokesmen at the Capital argue that it is better to have a conservative Democrat in the Senate than an ineffective Republican. Most dangerous, according to these business observers, are the members of the Congress who will not even say "Yes, but . . ." There will be fewer of the rubber-stamp approve-anything variety in the next Congress, all political forecasters predict.

ADVERTISING CONTROL—The Federal Trade Commission apparently is about to embark on regulation of advertising claims made by manufacturers of foods, drugs and cosmetics. One of the senior surgeons of the Public Health Service has been named medical adviser in this work. Some unfriendly critics of FTC note that "it has taken four months to get ready to begin." But the bigness and comprehensiveness of action to be expected is not fairly pictured.

DANGEROUS FISH—Shipment of fish scrap or fish meal involves serious fire hazards if the moisture content is not closely controlled. Safety men of the Association of American Railroads are urging that these fishery byproducts be restricted on the rails unless containing not more than 12 and not less than 8 per cent moisture. This proposed ruling will probably be the subject of vigorous debate later before ICC. Facts submitted by experts rather than emotional discussion will be required to settle the case.

TRUCK-DRIVER RULES—The Interstate Commerce Commission has fixed limits on the hours of service of drivers operating motor vehicles in interstate commerce as common carriers or contract carriers. Such men must no longer work more than 10 hours in any one day, or 60 hours in any one week. Privately owned trucks in interstate commerce are not regulated by these rules, but many think they will be similarly controlled later. The regulation of the private truck is on the ground of safety, not on the same theory governing the common-carrier group.

LABOR PUZZLES—The new law fixing wage-and-hour standards creates more questions than it answers. Perhaps most appalling to businessmen is the fact that even the Administrator cannot say what enterprises are within the law and what are outside its provisions. Here is why this is serious. Suppose an employer in good faith assumes that he need not comply with certain provisions of the law, and suppose that the Department of Labor agrees, at least tacitly, with this interpretation. There still remains the possibility that a disgruntled employee may bring civil suit against his employer under the law. And there is also the possibility that a local district attorney may proceed against the manufacturer in a criminal suit for violation of the law.

There are many other questions to be answered, among which is what food industries are exempt under Sec. 7c. So apparently the only way in which food executives can safely proceed is to lean a bit backwards in operating under the law, just as if it affected every individual on the payroll. Then executives can work through trade associations for the establishment of standards and definitions applicable to their particular business.

Shows How to Make New Wheat Germ Flour

Something new in milling, a process which produces a white flour that contains the nutritious germ of the wheat berry, was demonstrated August 6 by Morris Mills, Inc., Morris, Ill. More than 35 millers, bakers, flour buyers, milling machinery manufacturers, United States and foreign government agents and consultants were present.

The new milling process centers around the conditioning of the wheat berry to prevent separation of the germ and the endosperm during the removal of the bran and underlying layers of the wheat kernel. This conditioning results from the use of a large volume of air in the milling system necessary to the substitution of a combination purifier-separator unit for the customary individual purifiers and separators.

During the further milling steps the germ and endosperm are cut into finely divided granular particles instead of being ground to powder fineness, as by the standard steel roll method of milling. Also, the currents of air accompanying the mill streams keep the roll temperatures down to the point that the "breaks" run cool. Two-year storage tests are reported to show unexpected retardation of rancidity development and retention of vitamin potency.

If present plans carry through, Morris Mills, Inc., will continue to use the Morris, Ill., plant, a converted brewery, as an experimental and demonstration mill and leave the commercial production of this new flour to the established milling concerns on a royalty basis.

CONVENTIONS

SEPTEMBER

12–14—American Soy Bean Association, meeting will open at Wooster, Ohio, Sept. 12, and conclude in Columbus, Sept. 13–14.

19–21—Associated Coffee Industries of America, French Lick Springs, Ind.

19–21—Super Market Institute, Hotel Sherman, Chicago.

19–23—International Management Congress, Washington, D. C.

26–27—Tenth Boston Conference on Distribution, Hotel Statler, Boston.

OCTOBER

2 (week of)—Master Brewers Association of America, Hotel Statler, Buffalo.

6– 8—Convention and exhibition of the fishing industry, sponsored by Fishing Industry of New England, Hotel Statler, Boston.

9–14—American Dietetic Association, Milwaukee, Wis.

10–14—National Safety Council Silver Jubilee Congress, Stevens Hotel, Chicago.

17 (week of)—American Bakers Association, Hotel Sherman, Chicago.

17–19—International Association of Milk Dealers, Hotel Statler, Cleveland.

17–22—Dairy Industries Exposition, Public Auditorium, Cleveland.

20–22—International Association of Ice Cream Manufacturers, Cleveland.

20–21—Food Preservation Conference, School of Engineering, University of Tennessee, Knoxville.

21–25—Institute of American Meat Packers, Drake Hotel, Chicago.

24 (two weeks)—Sixth triennial meeting of International Society of Sugarcane Technologists, New Orleans and Baton Rouge, La.

30–Nov. 1—New England Bakers Association, fall meeting, New Haven, Conn.

31–Nov. 4—American Bottlers of Carbonated Beverages, Commerce Hall, Port of New York Authority Bldg., New York.

CONCENTRATES

• Secretary Wallace plans to subsidize the export of about 100,000,000 bu. of surplus wheat during the current crop year. Funds for this would be taken from the one-third of the customs receipts that are earmarked for this purpose by the 1935 AAA legislation. The country faces the second highest wheat harvest on record and possesses a record carryover.

• *Federal Surplus Commodities Corp. is buying for relief distribution an additional quantity of flour equivalent to 4,500,000 bu. of wheat, and it has been authorized to purchase 1,250,000 additional cases of grapefruit juice, 30,000,000 lb. of skim milk and 11,000 tons of raisins. FSCC recently bought 154,253 cases of canned tomatoes in the Ozark area.*

• Associated Grocery Manufacturers of America had so much success with its first Nationally Advertised Brands Week that it has decided to make this an annual event. Feb. 9 to 18 is the 1939 date. . . Brewers of a dozen mid-Western states recently decided at a meeting in Chicago to employ cooperative advertising which will use the insignia of United Brewers Industrial Foundation as part of a nation-wide program for the alignment of brewing in the public interest. . . As a move to gain the assistance of its stockholders in selling deviled ham, Wilson & Co., Chicago, in August mailed each of them a "deviled ham dividend." This dividend consisted of a 3-oz. tin of deviled ham, accompanied by a card describing the merits of the product.

• *Cheese-factory equipment should be sterilized with chlorine preparations to overcome the so-called "utensil flavor" in cheese, it is pointed out in a report from the New York State Agricultural Experiment Station, Geneva . . . Shad fishing has again become an industry in New York City. The catch in the Hudson River was between two and three million pounds this year. In early days shad fishing was done extensively at New York. . . . A new type of wheat yielding at least 10 per cent higher than the best existing British varieties has been developed in England at the Cambridge Plant Breeding Institute, it is reported. The wheat is said to be rust-resistant and to be able to withstand heavy storms because it grows short.*

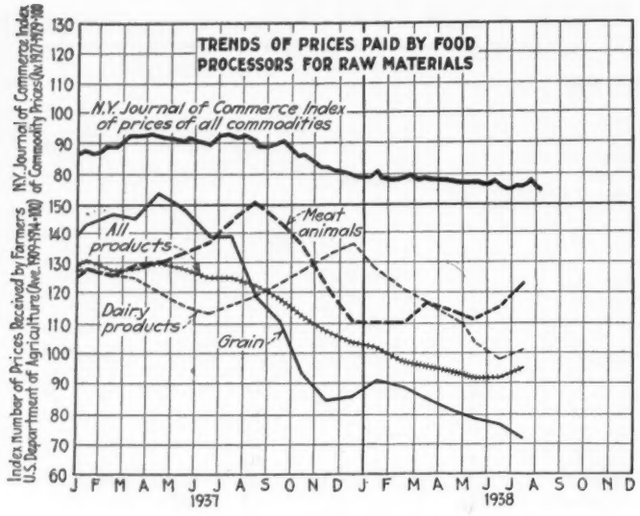
• In the National Emergency Council report on the needs and problems of the South are some facts significant to the Northern food industry:—The South has more than half of the nation's farmers but less than one-fifth the farm implements. In search for jobs, people in the productive middle ages leave the South in the greatest numbers, making it a land of the very old and the very young. The average income in the South in 1937 was $314 as compared to $604 for the rest of the country. Industrial wages in 20 important industries were less in 1937 by 16 cents an hour than in other sections. From 60 to 88 per cent of Southern families of low income spend for food less than enough to purchase an adequate diet. Pellagra, a disease due chiefly to inadequate diet, affects the South almost exclusively. Four-fifths of all they eat on Southern farms is purchased.

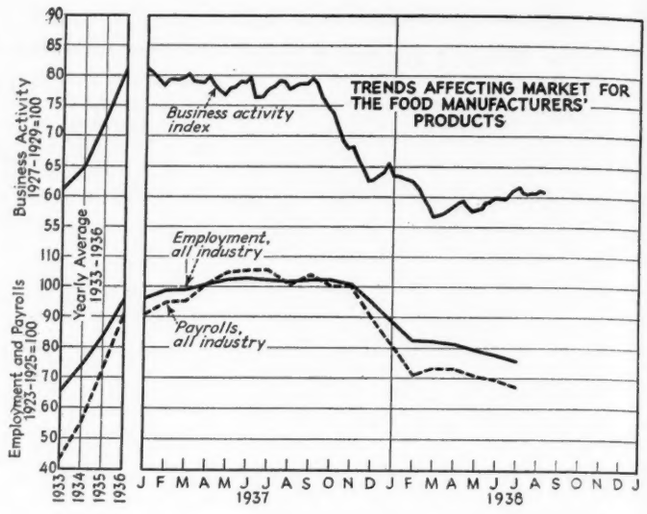
University to Hold Conference on Food

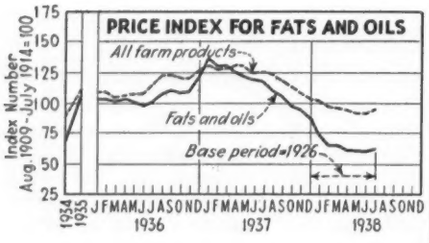
Food engineers and bacteriologists will have field days on October 20 and 21 when the University of Tennessee holds its Food Preservation Conference at Knoxville. A wide variety of problems in the food industries, including quick-freezing, marketing of frozen foods, enzymes, vitamins in frozen foods and the control of bacteria and mold with ultra-violet light, will be discussed by experts at this conference. American Society of Refrigerating Engineers is cooperating with the University in putting on the conference, and the expectation is to produce practical material similar to that dispensed at the conference at Pennsylvania State College last June.

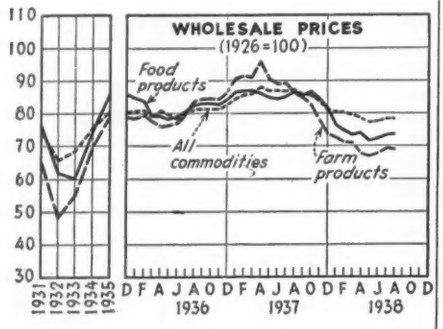
That the conference will prove practical is indicated by the following tentative program: "Refrigeration—a Vital Factor in the Food Industry," David L. Fiske; "The Meat Packing Industry," Henry D. Tefft; "Effect of Humidity on Food Products in Storage," A. J. Hecker; "Bacteria—the Friends and Foes of the Food Industry," Dr. P. W. Allen; "Enzymes—How They Behave," Prof. G. A. Shuey; "Vitamins and Quality of Frozen Foods," Gerald A. Fitzgerald; "Control of Molds and Bacteria with Light," Dr. Harvey Rentschler; "Cold Packing Fruits and Vegetables," C. T. Baker; "Quick Freezing Fruits and Berries," R. B. Taylor; "Marketing Frozen Foods," Harry Carlton; "Ice Crystal Formations in Frozen Foods," Dr. J. G. Woodruff; "Quality Control in the Manufacture of Butter, Cheese and Ice Cream," Prof. T. B. Harrison. Dr. L. V. Burton, editor of FOOD INDUSTRIES, will speak at the dinner which will follow the conference.

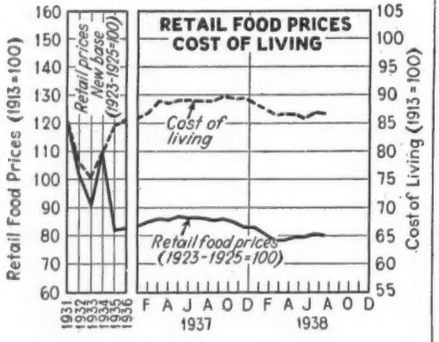
In addition to these talks, the program will include motion pictures of locker plants and of the processing of frozen foods.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
Index Number of Prices Received by Farmers U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
J F M A M J J A S O N D J F M A M J J A S O N D
1937
1938


TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Business activity index
Employment, all industry
Payrolls, all industry
Business Activity 1927-1929=100
Yearly Average 1933-1936
Employment and Payrolls 1923-1925=100
J F M A M J J A S O N D J F M A M J J A S O N D J
1937
1938


PRICE INDEX FOR FATS AND OILS
All farm products
Fats and oils
Base period=1926
Index Number Aug 1909-July 1914=100
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1936
1937
1938




RETAIL FOOD PRICES
COST OF LIVING
Retail prices New Base (1923-1925=100)
Cost of living
Retail food prices (1923-1925=100)
Retail Food Prices (1913=100)
Cost of Living (1913=100)
F A J A O D F A J A O D
1937
1938

Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on fats and oils are from the Bureau of Raw Materials for American Vegetable Oils and Fats Industries.

BUSINESS TRENDS

Commodity Prices Off As Harvest Rolls In

General commodity price indexes dropped somewhat in the four weeks from July 16 to August 13, 1938. For example, the general commodity price index of the New York *Journal of Commerce* fell from 77.3 to 74.7 in this time, making a low point for the current year. When this index is studied in the light of its components, it is found that the only important drops occurred in the grain and other food divisions, all other divisions showing little change for the period. This result was brought about by decided drops in food raw material prices, influenced by the large yields of important farm crops such as wheat and corn.

Other commodity indexes showed about the same performance. The index of the National Fertilizer Association fell from 74.7 to 73.1 in the four weeks from July 16 to August 13 and Fisher's index fell from 81.7 to 80.2 in the same period. In contrast, the New York *Journal of Commerce* weekly index of business activity stood at 75.1 on August 6, compared to 72.6 on July 16, reaching a new 1938 high.

Individual prices of important food materials recorded considerable drops in the same period. From July 16 to August 16, No. 2 hard winter wheat fell from 66¼¢ to 59¼¢; flour fell from $4.95 to $4.40; corn dropped from 59¾¢ to 53¢; beef, steers, fell from 16½¢ to 15½¢; pork loins dropped from 22¢ to 17¢; and cheese fell from 14½¢ to 13¼¢. Eggs and butter, with prices pegged by government purchases, remained steady. Cocoa and coffee, among imported products, were unchanged. Sugar, raw, fell 10¢ a hundred. Among canned products, salmon was unchanged, but tomatoes and peaches both had substantial price drops.

More News on Crops

The August 1 crop forecast of the U. S. Department of Agriculture, confirms the July forecast as to bumper yields for most important food crops in 1938. Some of the salient figures of this report are given below:

Crop	1938 Estimated	1937 Harvest
Wheat	955,989,000 bu.	873,993,000 bu.
Corn	2,566,221,000 bu.	2,644,995,000 bu.
Barley	248,283,000 bu.	219,635,000 bu.
Rye	52,500,000 bu.	49,449,000 bu.
Rice	53,595,000 bu.	53,004,000 bu.
Bean (dry, edible)	14,252,000 bags	15,839,000 bags
Potatoes	385,515,000 bu.	393,289,000 bu.
Sweet potatoes	82,743,000 bu.	73,393,000 bu.
Apples	134,867,000 bu.	210,673,000 bu.
Peaches	53,140,000 bu.	59,724,000 bu.
Pears	31,662,000 bu.	29,548,000 bu.
Grapes	2,490,000 tons	2,777,000 tons

Peanuts also promise to be abundant, with condition on August 1 reported at 78 per cent of normal, compared to a 74 per cent average for the date. The expected sugar beet crop is 11,138,000 tons, exceeding the 1933 record crop by 108,000 tons, and sugar cane harvested for sugar is expected to reach 7,156,000 tons, compared to 5,874,000 tons last year.

More Canned Fish

In a recent report of the Bureau of Fisheries, United States Department of Commerce, it was shown that the output of canned fishery products in 1937 valued at $104,937,000, was 11 per cent greater in value than the 1936 output and 40 per cent above 1935. Also the value of canned fishery products by-products, at $36,773,000 in 1937, was 5 per cent over the 1936 figure and 25 per cent over 1935.

More Fish in Storage

Cold storage holdings of fishery products in the United States on July 15, 1938, were estimated by the Bureau of Fisheries at 66,711,000 lb. This compares to 59,330,000 lb., a year before, and a five-year average for the date of 50,828,000 lb.

During the month ending July 15, 1938, the quantity of fishery products frozen was 22,589,000 lb., compared to 20,969,000 lb. in the corresponding period of 1937.

Citrus Fruit Yield At Record Heights

Reports of the United States Department of Agriculture put production of oranges in the United States for the 1937-38 crop year at 69,212,000 boxes. This is the largest crop of oranges ever recorded.

Grapefruit production was also high, being estimated at 28,417,000 boxes.

In 1936-37, the output of oranges was 55,174,000 boxes, and of grapefruit, 30,680,000 boxes.

Meat Consumption Higher

As always happens when consumer prices of meats are low, meat consumption is higher in 1938 than it was the year before. Based on figures estimated by the Department of Marketing, Institute of American Meat Packers, total consumption of meat and lard in May, 1938, was 959,000,000 lb., a 4 per cent increase over the 922,000,000 lb. consumed in May, 1937. This figure was, however, 6 per cent below the 1929-33 average consumption for the month of 1,022,000,000 lb.

When broken down into varieties of meat, these figures indicate a possible trend away from pork to beef and lamb. Beef and veal consumed in May, 1938, were 447,000,000 lb., compared to 445,000,000 lb. for the same month of 1937, and up 8 per cent over the 1929-33 average for the month of 413,00,000 lb. Lamb consumption in May, 1938, at 62,000,000 lb., was 11 per cent over May, 1937 and 15 per cent over the May average for 1929-33.

In contrast, while pork consumption rose 6 per cent to 390,000,000 lb. from May, 1937, to May, 1938, it fell off 19 per cent from the 481,000,000 lb. which was the average consumption for the month in the years 1929-33.

An interesting feature of this report is the considerable increase in lard consumption. In May, 1938, 60,000,000 lb. of lard was the estimated consumption, up 15 per cent over the 52,000,000 lb. consumed in May, 1937.

Construction News

	Pending (thousands)	Awarded August (thousands)	Total Awarded 1938 (thousands)
Bakery	.....	$40	$688
Beverages	$350	105	3,277
Canning and Preserving	150	.....	240
Confectionery	.....	22	62
Grain Mill Products	150	.....	570
Ice Manufactured	65	.....	260
Meats and Meat Products	80	.....	1,793
Milk Products	.....	40	597
Miscellaneous	240	40	4,294
	$1,035	$247	$11,781

Cottonseed Oil at Peak

Consumption of cottonseed oil during the 12 months from August 1, 1937, to July 31, 1938, was 4,268,703 bbl., the highest figure on record. In 1936-1937, cottonseed oil consumption was 2,970,178 bbl., and in the preceding season the figure was 3,044,340 bbl., the five-year average consumption being 3,063,000 bbl.

The carryover of cottonseed oil on July 31 was 1,533,100 bbl., compared to 1,157,900 bbl. on July 31, 1937. Imports of cottonseed oil from August 1, 1937 to July 31, 1938, totaled 161,503 bbl.

Business Still Up

Moving slowly in the opposite direction from the normal summer trend, business showed some slight improvement in the five week period from July 16 to August 20. During that time the *Business Week* weekly index of business activity rose 1.12 per cent and the N. Y. *Journal of Commerce* weekly index of business activity also rose. This trend, in addition to being contra-seasonal, occurred in spite of a falling off in most wholesale price indexes for the period.

During the month, automotive production dropped but was still higher than seasonal considerations alone would have indicated. Steel production mounted above 40 per cent of capacity, to a high point for 1938. Construction activity was well above the 1937 level and also above preceding periods of 1938. Electric power production recovered from the low point of earlier in the year until it almost reached the high 1937 level.

The United States Department of Labor indexes of wholesale prices for the four weeks ending August 13 showed 0.51 per cent loss for the general index, 3.46 per cent loss for the farm price index, and 1.90 per cent loss for the food price index. The weekly weighted commodity price indexes of the N. Y. *Journal of Commerce*, five weeks ending Aug. 20, showed 2.71 per cent drop for the general index, 9.15 per cent loss for the grain price index, and 8.60 per cent decrease for the food price index.

INDICATORS

BUTTER PRODUCTION in June, 1938, was estimated by the U. S. Department of Agriculture at 204,393,000 lb., compared to 197, 526,000 lb. in June, 1937, and a 1929–36 June average of 193,226,000 lb.

OLEOMARGARINE SALES in June, 1938, were 24,751,742 lb., compared to 26,244,580 lb. in June, 1937, as represented by tax stamp sales.

CORN PRODUCTION for canning in 1938 is estimated by the U. S. Department of Agriculture at 785,300 tons, compared to 978,500 tons in 1937, and a 1927–36 average of 591,600 tons.

TOMATO PRODUCTION for manufacture in 1938 is estimated by the U. S. Department of Agriculture at 1,558,400 tons, compared to a production of 1,973,800 tons in 1937.

GREEN AND WAX BEAN PRODUCTION for canning in 1938 is estimated by the U. S. Department of Agriculture at 121,000 tons, compared to a production of 105,300 tons in 1937.

FROZEN FRUITS in storage, August 1, 1938, totaled 151,351,000 lb., compared to 125,372,000 lb. on July 1, 1938.

FROZEN VEGETABLES in storage, August 1, 1938, amounted to 45,094,000 lb., compared to 16,651,000 lb. on August 1, 1937.

BUTTER, CREAMERY, in storage on August 1, 1938, was 172,505,000 lb., compared to 123,863,000 lb. a year before, and a 1933–37 average for the date of 127,286,000 lb.

CHEESE, all kinds, in storage on August 1, 1938, totaled 132,669,000 lb., compared to 118,235,000 lb. on August 1, 1937, and a 1933–37 average for the date of 104,090,000 lb.

EGGS, case equivalent, in storage on August 1, 1938, were 10,274,000 cases. This compares with 13,486,000 cases on August 1, 1937, and a 1933–37 average for the date of 12,081,000 cases.

POULTRY, frozen, in storage on August 1, 1938, amounted to 52,561,000 lb., against 70,040,000 lb. a year before and a 1933–37 average for the date of 50,079,000 lb.

MEAT, all kinds, in cure and storage on August 1, 1938, was 477,314,000 lb., compared to 578,649,000 lb. on August 1, 1937, and a 1933–37 average for the date of 661,826,000 lb.

LARD IN STORAGE on August 1, 1938, was 123,649,000 lb., compared to 156,959,000 lb. on August 1, 1937, and a 1933–37 August 1 average of 154,235,000 lb.

WEEKLY FOOD INDEX of Dun & Bradstreet was $2.46 for the week ending August 9, compared to $2.90 a year earlier.

MEN, JOBS and COMPANIES

INDUSTRY

» ADOLPHUS RICE MILLING Co. has constructed a modern new plant in Houston, in the heart of the Texas rice belt. Heading up the Adolphus company is Adolph A. Pfeffer; the secretary-treasurer is Adolph L. Pfeffer. These men formerly owned and operated Adolph Pfeffer Rice Milling Co.

» AMALGAMATED SUGAR Co. has complete at Nyssa, Ore., a new beet sugar factory which will process beets from Oregon and Idaho.

» ANHEUSER-BUSCH, INC., St. Louis, has started construction of a new 80,000-bbl. stock house which will cost $650,000.

» ARKANSAS MILLING Co. is operating the former Arkadelphia (Ark.) Milling Co., which has been idle six years. The old plant formerly was one of the largest flour and meal manufacturing establishments in the Southwest.

» ARMOUR & Co. is soon to start construction of a new $1,000,000 packing plant on a 15-acre site near the Buffalo Bayou, Houston, Tex. Meat processed at the new plant will be shipped to the Eastern market.

» J. B. CARR BISCUIT Co. is establishing a branch plant at Greenwood, S. C., at a cost of $175,000 to serve Virginia, North and South Carolina, Georgia, Florida, Alabama, Mississippi and parts of Louisiana and Tennessee.

» CEDARBURG (Wis.) CANNERIES, INC., is now engaged in the production of quick frozen peas and corn on the cob.

» W. H. COPELAND Co., INC., Warrenton, Ore., contemplates the expenditure of $40,000 in the construction of a plant for freezing vegetables and seafoods.

» DAIRYMEN'S LEAGUE COOPERATIVE ASSOCIATION, INC., has purchased the Newark (N.J.) Milk Co., whose business has been conducted by bankruptcy trustees since January, 1934.

» FLETCHER COFFEE & SPICE Co., Little Rock, Ark., has purchased Tierney Salad Dressing Co. and plans to make it the largest factory of its kind in Arkansas. Don C. Tierney, former owner, will continue as manager of the plant.

» FOLGER COFFEE Co. will construct a $100,000 coffee roasting plant at Houston, Tex.

FRANK A. KEMP

He again has been elected president of United States Beet Sugar Association. H. A. Benning, Utah, was chosen vice-president and Neil Kelly, Washington, D. C., secretary-treasurer.

» GORDON BAKING Co. will construct at Salamanca, N. Y., a $50,000 milk condensery.

» ITALIAN - AMERICAN MACARONI MANUFACTURING Co., a new concern, is opening a $100,000 plant at Birmingham, Ala. The plant will have a daily capacity of 30,000 lb. Its operations are headed up by Dominick Simonnetti.

» LANGENDORF BAKERIES, INC., will enter the Northwestern area, with bakeries in Spokane.

» NATIONAL GRAIN YEAST CORP., Belleville, N. J., has purchased a former plant of Bowman Dairy Co. at Crystal Lake, Ill., and is converting it into a yeast-growing plant. Operations will begin about October 1.

» NORTHWESTERN YEAST Co., Chicago, is building a new $500,000 yeast plant and has placed an order for $80,000 worth of stainless steel equipment. The equipment includes four fermenters of 50,000 gal. capacity and seven large storage tanks, according to Pfaudler Co.

» OSHKOSH (Wis.) BREWING Co. has doubled its former capacity by constructing a new bottling house at a cost of $50,000.

» PFAELZER BROS., Chicago, have let the contract for the construction of a two-story and basement addition to its meat plant at a cost of $50,000, including equipment.

» SPENCER KELLOGG & SONS, INC., Buffalo, has purchased the soy bean plant of Shellabarger Grain Products Co., Decatur, Ill. Crushing of soy beans and refining and sale of soy bean oil is becoming an increasing part of the company's business.

» SWIFT & Co. has purchased for $700,000 a group of eight cottonseed oil mills belonging to the estate of the late Col. Marvin E. Singleton, St. Louis. This purchase was made possible through revision by the State of Texas of a 22-year old consent decree ordering packing firms to dispose of their cottonseed oil properties when a fair price could be obtained, operating them meanwhile under a trusteeship. The modification of the decree removes the necessity of eventual sale of the property and permits Swift to expand its cottonseed oil business in Texas. Swift also will expend $750,000 in reconstruction work at its packing plant in Los Angeles.

PERSONNEL

» JOHN H. BARTON has been elected president of National Oil Products Co., Harrison, N. J. He succeeds Charles P. Gulick, now chairman of the board.

» DR. WILLIAM CLAYTON, who served as head of the London laboratories of Crosse & Blackwell for eleven years, is taking a position with Metal Box Co. as personal assistant to Robert Barlow, managing director.

» C. N. COULTER has finished his special problem work for Siren Mills Corp., Chicago, and has gone to Mexico City on a temporary job.

» CHARLES ELLIOT, former plant superintendent of Wilbur Chocolate Co., is now with Warfield Chocolate Co., Chicago, doing quality control work.

» LOUIS EHRENFELD, technical director of Wahl-Henius Institute, Chicago, has joined the Premier Pabst Corp., Milwaukee, as assistant manager of operations. He has been succeeded at Wahl-Henius by Eric H. Hutchison, recently brewmaster for Storz Brewing Co., Omaha.

» L. MARQUARD FORSTER has been elected president of Hyde Park Brewery, St. Louis, to succeed the late Henry Nicholaus. Fred Snell succeeds Mr. Forster as vice-president.

» NEDJATI FUAD, former chief chemist of American Molasses Co. and Nulomoline Co., and former research director of Applied Sugar Laboratories, is now associated with Refined Syrups & Sugar, Inc., New York, as technical director of sales. He will direct the development of new sugar products, these to be manufactured at the company's refinery at Yonkers, N. Y.

» WINFIELD S. HUBBARD has resigned as chief chemist of Schwarz Laboratories, Inc., New York, and becomes plant superintendent and supervisor of the pharmaceutical research laboratory of Drug Products Co., Inc., Long Island City, N. Y., on Sept. 6.

» DAN JENKINS has been transferred to Greensboro, N. C., to manage the Dr. Pepper Co. plant there. Mr. Jenkins had been in Florida and Georgia for some time.

» EDWARD F. KAERABECK recently was named manager of Swift & Co.'s plant at Sioux City. Transferred from Swift's Chicago office, Mr. Kaerabeck succeeds Frank A. Gale, retired.

» D. E. KINDER, baking technologist of the Technical Institute of Independent Biscuit Manufacturers Co., Inc., has joined the sales service staff of Igleheart Bros., Evansville, Ind. He has been succeeded at the Technical Institute by William Hanks.

» FRANK A. MILLER, vice-president of Rahr Malting Co., is president of the newly formed Miller Malting Co., Los Angeles. Earl F. Miller, Western sales representative for Rahr and son of the president of that company, is general manager of the new malting concern. The company is building a plant with a capacity of 600,000 bu. annually.

» FRANK E. NOYES, executive secretary of Ohio Bakers' Association, has established Frank Noyes Pies, Inc., at Columbus, Ohio.

» ERNST VON PLESS, with General Baking Co. in Buffalo, N. Y., since 1916 and until recently assistant manager of its unit in that city, has been promoted to manager of the Buffalo plant. He succeeds Donald Durbin, who has been transferred to the Syracuse plant.

» RALPH P. TITTSLER has left the University of Rochester, where he taught general bacteriology and did research work, to go with the research division of the Bureau of Dairy Industry. In his new position he will do research work under the supervision of Dr. L. A. Rogers.

DEATHS

» WILLIAM CURTICE DARLING, 82, manager for many years of the Sycamore (Ill.) Preserve Works, July 22. Mr. Darling first entered the canning industry in 1873.

» JOSEPH GRIESEDIECK, 75, president of Falstaff Brewing Co., St. Louis, July 14.

» MAX HAHN, 75, founder of the Max Hahn Packing Co., Dallas, Tex., which he operated for 38 years, July 28.

» VICTOR HUGO, 71, plant superintendent of Martin Bros. Food Products Co., Denver, recently.

» A. S. HERZ, 59, founder and president of Herz-Oakes Candy Co., St. Louis, August 4. He had been in the candy business for about 40 years.

» ROBERT C. ISALY, 33, associated with H. R. Isaly & Sons Co., Columbus, Ohio, and a son of the founder of the business, August 10, after a long illness.

» R. B. JOHNS, 72, president of Antigo (Wis.) Canning Co., August 5.

» B. H. KROGER, 78, founder in 1884 of Kroger Grocery & Baking Co., Cincinnati, July 21, at Wianno, Mass.

» DR. H. E. VAN NORMAN, former director of research for Borden Co., July 28, in Chicago. Dr. Van Norman had been with the Chicago Mercantile Exchange since the closing of the dairy exhibit at A Century of Progress Exposition.

» GEORGE C. WIELAND, 63, founder and for many years president of Wieland Dairy Co., Chicago, July 29, from heart attack.

ASSOCIATED INDUSTRIES

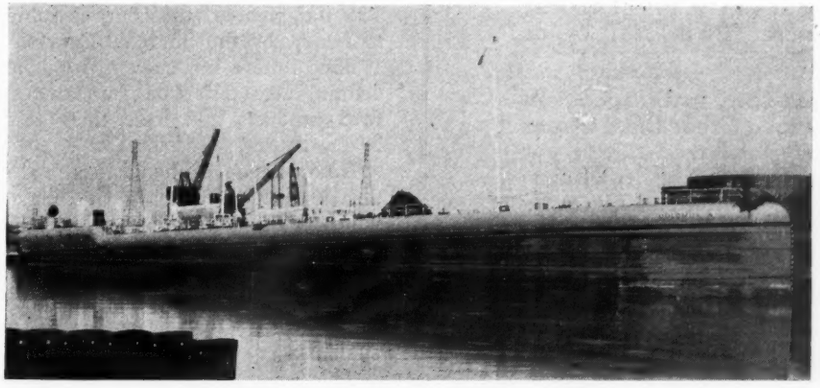
» LINK-BELT Co. has appointed William W. Bond Western sales manager of the positive drive division with headquarters in Indianapolis.

» NATIONAL OIL PRODUCTS Co., Harrison, N. Y., has expanded its manufacturing and service facilities by the purchase of the plants of Vitab Cos.

» OAKITE PRODUCTS, INC., New York, has appointed H. C. Duggan to take charge of sales and service in the Detroit division owing to the illness of J. A. Maguire.

» WESTINGHOUSE ELECTRIC & MFG. Co. has reorganized its air conditioning department, locating the headquarters for this department at East Springfield, Mass. P. Y. Danley is manager of the department.

» WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J., has appointed Ludwig Emde, Detroit sales manager.



FREIGHTER FOR FOODS AND CHEMICALS

Equipped with holds lined with pure nickel, arc-welded in the seams and spot-welded to the frame, Dolomite IV can transport all kinds of foods and chemicals in bulk. Put into service on the Great Lakes last month, it hauls grain one way and kerosene the other (the holds are quickly cleaned and deodorized with steam jets). It will enter deep-sea service in November, carrying grain, molasses, oil, caustic soda and other products between Lake Charles, La., and Norfolk, Va. The ship is a 5,500-ton, 300-ft., diesel-powered vessel owned by Dolomite Marine Corp., Rochester, N. Y.

Standards Under Food Law

(*Continued from page 488*)

court did not see how the government could establish a standard by such testimony. This fact, together with the additional hurdle of interpreting the analysis of the preserves (the attorney for the defendant was successful in having all the evidence as to their interpretation stricken from the record), caused the court to indicate that it would discharge the defendant. Therefore, the government moved to dismiss the case, in the preparation of which about $10,000 had been spent.

This clearly indicates the need for power to make a standard which will stand up in court. Such authority is now given to the Secretary under the provisions of Sec. 401 of the new act. Although, the main provisions of the new act do not go into effect until June 25, 1939 (the 1906 act remains in force and effect until then, the provisions of Sec. 701 became effective June 25, 1938. The Secretary right now is authorized to conduct hearings and promulgate regulations to become effective on June 25, 1939, or later.

Under Sec. 701, the Secretary (on his own initiative or upon application of any interested industry or substantial portion thereof who state reasonable grounds therefor) will hold public hearings on the making of standards. Public notice will be given. The time and place of such hearing is to be not less than 30 days after date of notice.

At these hearings any interested party may be heard either in person or by representative. After the hearing, the Secretary will make public his action. In making his order, the Secretary will set forth, as part of the order, the detailed findings of fact on which the order is based. And such order will take effect not sooner than 90 days, barring an emergency.

In case some person desires to contest it he may, before the end of the 90-day period, file a petition for review of such order with the Circuit Court of Appeals of the United States for the circuit in which he resides or has his principal place of business. The Secretary then transmits to the court the proceedings and record on which the order was based. If the petitioner desires to produce additional evidence and shows that it is material and that there was reasonable grounds for his failure to produce it before the Secretary, then the court may order such evidence taken and also evidence in rebuttal thereto. The Secretary can thereafter modify his findings, or make new findings, because of such new evidence. Then the court can either affirm the order or set it aside, in whole or in part, temporarily or permanently. It can also order the Secretary to take action where he refuses to issue, repeal or amend an order which is not in accordance with law. The judgment of the court is subject to review by the Supreme Court.

Thus, there is now a legal and definite way to create standards for food products and have them tested by the courts.

It now behooves the various food industries such as the margarine, mayonnaise, baking and others which make products that are not as yet standardized with any degree of satisfaction to immediately petition the Secretary to call a hearing for the making of such standards.

There is reason to believe that the same standards previously determined by the Joint Committee will be reestablished. Hence, if any such standards are obnoxious to the industry affected, the members thereof should begin to assemble evidence to be used in the public hearing on such standards to cause the Secretary to modify them.

Mother Goose

was AHEAD of her time

"Pat-a-cake, pat-a-cake, Baker's Man,
Make a cake *as fast as you can!*"

That bit of advice means more today than it did a century ago. "Make a cake (or biscuits, or bread or sweet goods) as fast as you can", says Mother Goose. "Do it . . . or else!" says Competition.

Bright Biscuit Company, of Kansas City, makes good on this in a big way, with each of the above Greer Band Ovens turning out 2,000 to 3,000 pounds of baked goods per hour. Each oven is 224 feet long and fired by 150 Kemp ribbon-flame burners, to which Kemp Industrial Carburetors supply 100% premixed gas and air, for complete combustion and constant flame pressure. Temperature is uniform in all parts of the oven, heat liberation is greater and fuel consumption per pound of product drastically reduced.

For Ovens Old or New,
Better see what Kemp can do.

Write today, to **The C. M. Kemp Manufacturing Co., 405 East Oliver Street . . . Baltimore, Maryland.**

KEMP of BALTIMORE

Changes Brewing Practise

(*Continuet from page 487*)

generally characterized by a disagreeably harsh or "grainy" taste. Through study by F. P. Siebel, Sr., of Siebel Institute of Technology, it became evident that incomplete enzymic action, particularly that involving proteolytic enzymes, might be responsible for the "grainy" taste.

Research studies were made on (1) the effect of grinding the malt to varying degrees of fineness; (2) the effect of inclusion or omission of the husks in the ground malt; (3) the effect of using varying proportions of water for doughing-in the grist; and (4) the influence of constant agitation of the mash in combination with the factors stated under (1), (2) and (3).

This research revealed that the worts and beers possessing the mildest and smoothest taste, as well as the highest content of permanently soluble proteins, were those obtained from mashes in which the husks as well as the endosperms of the malt had been ground to a flour-like fineness. In addition, the mashes giving these worts differed in that the quantity of water used for doughing-in the grist was considerably in excess of the usual proportion and in that the mashes were kept in a constant state of agitation.

These results were somewhat of a surprise, because strong opinions had generally been expressed by brewing authorities that the husks of the malt gave the beer an unpleasant taste. But additional studies brought to light the fact that finely ground malt in a thin, very liquid mash under constant agitation extends the influence of the mashing process to the aleurone layers lying directly underneath the malt husks. These layers had hitherto-offered such resistance to any mash action, because of the lack of disintegration in the roller-mill crushing, that they could be found practically unchanged in the spent grains.

These aleurone cells, and particularly their protein-like substances, assumed a new and double rôle in this special mashing procedure. They were now made available to, and underwent, far-going enzymic changes, and they contributed markedly to the enzymic activity itself. This gave the wort that distinctive, pleasant mellowness that carried on into the finished beer and gave a foam of outstanding density and stability.

Since Dr. Siebel began his studies on the results obtainable through the use of finely ground malt and the evolution of a new mashing practice, confirmatory results have been reported by other brewing investigators working independently.[1, 2, 3]

Whatever may be the technological aspects of this simplified brewhouse procedure, the practical aspects to us are: (1) a decided saving in initial capital investment for equipment, floor space and buildings; (2) a saving of approximately 35 per cent in power and fuel cost; (3) substantial economies in the time required per brew and in the labor requirements; and (4) an increase of 6 to 8 per cent in the yield obtained from the brewing materials.

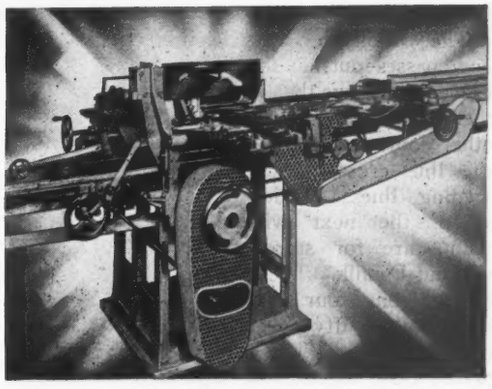
These measurable advantages of this new system of brewing over the conventional practice are in addition to those intangible ones which we believe give us a finished beer of superior quality with respect to taste, flavor, mellowness and foam.

REFERENCES

[1] Luers, Wochenschrift für Brauerei, p. 557, 1930.
[2] Mann and Harlan, U. S. Department of Agriculture Bulletin No. 183.
[3] Renberg, Wochenschrift für Brauerei, p. 28, 1930.

When the Sales Dept. says "YES"

This machine won't say "NO"



Too often in the past a good merchandising idea had to be shelved because the packaging machinery was not, or could not be, adapted to handle it.

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Here's what happens right along: One company decides to market its product in a larger or smaller size . . . Another adds an entirely new product to the line. . . A third improves the appearance of its package by using a different wrapping material . . . A fourth decides to get out a special combination offer of two products in one wrap. . . Another would like to market its goods in an open tray with a transparent wrap to display the goods.

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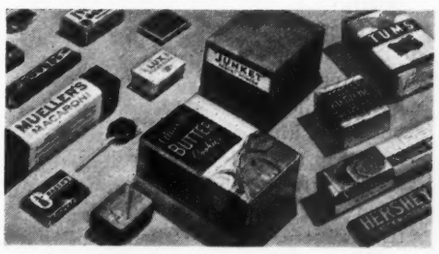

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PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

How 57th St. Delivers Milk To Manhattan

(*Continued from page 500*)

The wholesale loading line and loading stops are shown on the same first-floor plan as are the retail routes. Leaving the ramp and entering the first floor, the wholesale trucks make a right turn and form a line alongside the retail trucks which also turn to the right. The first wholesale stop is at a platform extending inward from the 56th Street wall of the building. At the first and second loading stops, milk in paper containers is picked up. Next, off the same platform, are two byproduct loading points. Then from a second platform of the same width as the first, are obtained byproducts and ice at two separate loading points. This platform has a small chill box and an ice hoist leading up from the main ice storage directly below. (Both these platforms are served by a connecting system of conveyors with loading-point extensions, as shown.)

The wholesale-truck loading line now passes outside the building onto Eleventh Avenue through one door and then reenters the building through another door. In its in-and-out passage, the line crosses each of the retail loading lines. Inside the building again, the next wholesale loading points are for store grade A and vitamin D milk. The products are secured from four trailers "spotted" against the Fifty-Seventh Street wall of the building. The trailers may be placed close together or separated, as there is need for only one store A and one vitamin D loading point at the same time.

The wholesale line then proceeds straight along the driveway, running parallel, but in the opposite direction, to the retail line against the central platform. Farther along, it turns right, passes the foot of the ramp from the upper floor, hugs the edge of the platform on which the chill box next to the bottle-washing and filling rooms are located and finally reaches a loading platform facing on Fifty-Sixth Street. Four separate loading positions are provided at this platform. The trucks from the wholesale line back into these positions and are loaded from the rear. All previous loading points have been from the side.

At these loading points, the trucks get their store grade B bottled milk. These come from the chill box directly behind by means of four conveyor loading extensions to the edeg of the platform. With these products, the wholesale loading is completed and the trucks then pass out into Fifty-Sixth Street and are off to their first deliveries.

One of Sheffield insulated wholesale-route trucks—Theurer body on Dodge chassis. It has door on each side for convenience in making deliveries on curb side on one-way streets. Rear door is offset to right so that it does not extend beyond body side when open.

All grade B milk delivered on the retail and wholesale routes is processed at the plant. From the bottling room shown in the first-floor plan, the cases pass by conveyor to the adjacent chill box. The cases are iced there with flake ice at a loop in the conveyor. Then they pass, at present, through a conveyor tunnel under the driveway at the head of the loading platform, going up into the upper plain grade B chill box shown in the first floor plan. Then they reach the lower plain grade B chill box by conveyor extension.

In the chill room adjacent to the bottle fillers, provision has been made for a second connection to the existing conveyor, to lead down through a second conveyor tunnel and up directly into the lower plain grade B chill box. The chill-box conveyors are reversible, and when both tunnel conveyors are installed, each chill box may get its milk direct or through the other box. The same conveyor also has an extension into the third, or miscellaneous, chill box on the loading platform.

GRADE B store milk, after being iced in the chill box adjacent to the bottle-washing and filling rooms, is stored in the end of this chill box near to the Fifty-Sixth Street loading platform which serves the wholesale-route trucks.

When the trucks return from their routes, they enter the plant in three distinct lines. The retails run along the edges of the center platform from which they left earlier in the morning, but in the opposite direction. The wholesales run along the edge of the Fifty-Sixth Street loading platform. The returned goods from the retail routes are unloaded onto the platform, checked and placed in one of the three chill boxes. Cases of empty bottles are unloaded directly onto two conveyors which are set flush with the floor of the platform along the edges opposite the two plain grade B chill boxes. These conveyors descend through openings near the rounded noses on the inner end of the platform, near the ramp exit, pass to the tunnels under the first floor and descend to a case-storage room in the basement.

The area covered by the retail routes reaches from the Battery (the lower end of Manhattan) to 145th Street on Manhattan Island. This is an area roughly 9 miles long by 2 miles wide. In it are included all types of dwellings, from the cold-water, walk-up tenement through the middle-class elevator house to the individual private residence and the high-class, cooperatively owned apartment. The area covered by the wholesale routes extends from the Battery to 100th Street.

The area described is served by 192 retail and 45 wholesale routes out of the 57th Street plant. This total will be increased subsequently, when the present West 28th Street branch, now covering part of the area, is closed and the routes are transferred to the new plant. This will add 100 more retail routes, giving a total of 337 routes made up of 292 retail and 45 wholesale routes.

From the previous description of the second and third-floor garage areas, it is noted that without the use of aisle space, these two floors can accommodate a total of 373 trucks of the types and sizes employed. This is 36 trucks over the number of routes to be run and provides for the necessary spare vehicles and a small increase in the number of routes.

The area now served from Fifty-

Seventh Street was formerly covered principally by horse-wagon routes. There were 202 of these—62 out of the old Fifty-Seventh Street stables, 70 out of the West Twenty-Eighth Street branch and 70 out of the One Hundred Twenty-Fifth Street plant. In addition, there were 30 electric-truck retail routes out of the Twenty-Eighth Street plant and 60 routes at Fifty-Seventh Street. With complete motorization at the new plant, the net result of the route adjustment is a total of 337 motor routes, consisting of 292 retail and 45 wholesale routes.

In the operating and cost study made prior to the opening of the new plant and the elimination of the horse routes, certain types and sizes of trucks were selected as the most economical and desirable in accordance with the work to be performed. Roughly, the retail types selected were determined by the route mileage and the flatness or hilliness of the streets on the routes. The retail loads are practically constant and do not exceed the capacity of a conventional 1½-ton truck. All of the new retail trucks, except 70 new Dodges, are of the stand-drive type with a low aisle from one side door to the other. This permits easy loading of the cases through the side while parallel with the loading platform and reduces the physical energy expended by the driver-salesman in getting on and off the vehicle while making deliveries on the route.

For the shortest routes, electrics were selected. Eighty new Walker electrics, designed especially to meet the Sheffield delivery conditions and incorporating several innovations, were purchased and first operated out of the new plant. They are used on routes 8 miles in length but have a battery capacity of from 14 to 16 miles.

Gasoline trucks are employed on the routes beyond those served by the electrics. Their routes average 10 miles or more. Those operating just beyond the electrics are Divcos with small, four-cylinder engines. Beyond these to the limits of delivery area, Ford V-8's and six-cylinder Dodges are employed. Thus, when all of the routes served by the Twenty-Eighth Street branch are transferred and the new plant is in full swing, the make-up of its vehicular route fleet, exclusive of special-delivery and miscellaneous-route trucks, will be as follows.

Retail routes	
All Electrics	117
Divcos	70
Dodges	70
Fords	60
Total	317
Wholesale routes	
Dodges	45
Total retail and wholesale	362

Loaded two cases high, the Walker electrics can carry 32 cases; the Divcos, 20 cases; the Fords, 32 cases; and the Dodges, 26 cases. Upon demand, all of the trucks could be loaded four cases high. No racks are employed in any of the bodies. For the wholesale or store routes, new six-cylinder Dodges with fully enclosed panel bodies are used. These are large enough to accommodate 96 cases of milk in glass bottles, loaded four high, in addition to 72 cases of milk in paper containers, stacked three high, and from six to eight 300-lb. cakes of ice.

The Dodge bodies are insulated but not refrigerated. Three inches of Kapok is used in the roof; 2 in. of Naturezone in the sides and ends and 2 in. of cork in the floor. These bodies have three doors, one on each side and one in the rear. The two side doors permit loading off the platform on either side, and they allow delivery through the curb-side door on the one-way streets which predominate in the areas served. The rear door is not in the center of the body but is offset to the right. When opened and folded back against the body, the outside edge, that opposite the hinges, does not extend beyond the side line of the body proper. This is to prevent sideswiping by other vehicles when the door is opened to make rear-end deliveries on narrow streets or alleys.

Cold Storage Facilities

(*Continued from page 504*)

only advantages this industry offers the frozen foods industry. Most ice cream plants now own and operate refrigerated trucks. These trucks at present call regularly on the institutional trade. The ice cream industry is familiar with and accustomed to store-door delivery.

The potential of the ice cream industry is not based alone on theory. The other map shown herewith indicates the type of distribution employed by one of the quick freezing companies in distributing quick-frozen foods to the institutional trade. Most of this company's distribution outlets are ice cream manufacturers. These ice cream companies not only warehouse the frozen food but call on the trade, take orders and deliver. They are in a position to render complete and economical distribution service.

The ice cream industry is extremely seasonal. Winter month deliveries of some ice cream manufacturers drop as low as 10 per cent of peak summer deliveries. The frozen food pack which goes into storage in the Fall is largely sold by the time summer is advanced. The storage curves of ice cream and frozen foods are opposite. The one is fat when the other is lean. Together they keep the hardening rooms filled at no greatly increased cost. Trucking and employment are also seasonal in the ice cream industry. The distribution of frozen foods by the ice cream plant levels off the curves of storage, deliveries and employment. The ice cream industry has thus far made a success of frozen food distribution to the institutional trade.

Most of the frozen food distribution by ice cream manufacturers has been made by chains of ice cream plants. There are more than 30 sectional and national chains in the country operating at least 500 ice cream plants and some 400 additional distributing stations. They may be expected to play an important role in frozen food distribution.

The ice cream manufacturer has acted so far mainly as distributor to the institutional trade. In the past this has been the important market. The retail distribution of frozen foods is now of growing importance. Just how the ice cream manufacturer will fit into the retail distribution of frozen foods is a question of considerable concern to at least a few of them. When the ice cream manufacturer starts delivering frozen foods to the grocery store, the ice cream manufacturer will sell packaged ice cream possibly through the same cabinets used for the storage and display of frozen foods. This appears inevitable. And it is sure to antagonize the drug store trade. There are, however, less than one-twentieth as many drug stores with fountains as grocery store outlets in the country. There is also a growing tendency among drug stores to manufacture their own ice cream. Then, too, probably more than 500 ice cream manufacturers are in direct competition with the customers of the ice cream manufacturer who wholesales. These companies are moving a heavy volume of ice cream through their own stores, mostly dairy stores, many of which stock a limited line of grocery products. Already, not a few grocery stores are selling ice cream. Much of it is made in their own stores in their own counter freezers. The ice cream manufacturer is surrounded by complicated marketing problems.

Many ice cream manufacturers will hesitate at making the jump into the retail distribution of frozen foods, including ice cream, to the retail grocery store trade. But jump they will—jump they must—for the odds are in favor of the jump.

Putting All Executive Minds to Work

(Continued from page 481)

The junior board then turned its attention to the entire line. None of the members liked the old-fashioned labels on many of the items and said so with considerable emphasis. So labels and packages were changed, harmonized in color arrangement, and brought up-to-date generally without destroying their trademark value.

In all of the redesigning, the first consideration of the discussions was the effectiveness of the packages when finally displayed in the stores of dealers. This led to the proposal that the company set up a model grocery store in its general offices, so that all packages could be studied from the consumers' viewpoint, and retail dealers furnished with suggestions as to store construction and arrangement, as well as with examples of attractive displays.

This proposal was accepted. The model store was built and has proved to be a valuable asset from every standpoint. Besides its assistance to us in studying package displays, it has been a guide in designing, improving and remodeling innumerable retail stores. Several thousand retail dealers have called to see it every year, and it has proved to all of them that a modern, inviting store can be constructed and arranged at a comparatively moderate cost.

In many instances, the junior board has shown an unusual open-mindedness. As a typical example of this characteristic, when the question of displaying the goods of several prominent competitors was brought before the senior board, it was considered with immediate disfavor. The seniors could find no reason for displaying and advertising the products of our competitors. But members of the junior board thought otherwise. They contended that certain competitive products are standard in the trade, are found in the shelves of the best retailers, and that our goods should be studied in contrast with the competitive products. And the junior board had its way.

APPARENTLY there is nothing connected with the advancement of the business that the junior board has not discussed. During its first eighteen months, it had a hand in the management of everything from credits to numerous details of our export trade. The expansiveness of the board's thought and activities is one of its most valued characteristics. It has even improved the office routine in several particulars.

For example, in the spring of 1933, a member of the board reported at a meeting that a superficial investigation of his own showed that some of the office stenographers were not up to standard. He said they were not as rapid as they should be, that they misspelled a good many words, and lost much time in looking up the correct spelling. After discussion, the board recommended that all stenographers not up to standard be transferred to typing jobs in the advertising department or elsewhere, and that business-trained, experienced girls be substituted for them.

This change did not deprive any girl of a job, and it immediately eliminated the annoyance and expense of subnormal speed and misspelling in getting out the company's correspondence. After several weeks, a check-up showed that the change had increased the efficiency of our stenographers at least 30 per cent.

Before the junior board began to function, I supposed that the men would be carried away, in some instances, by their enthusiasm, and would be inclined to try out highly problematical ideas at the expense of the company. But this anticipated fault never has materialized. In fact, the general attitude of the board has been one of caution, especially where expense is an important factor.

The story of our billing machine illustrates the conservatism of the board and shows how thoroughly the members consider the interests of the company. A member of the billing division brought to

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WIDER MARGIN
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Oakite Cleaning and Sterilizing Materials so surely provide

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When so much depends on maintaining quality, purity, and flavor of your product, you cannot be too careful about cleaning and sterilizing your food processing equipment.

Recognizing this fact, an increasing number of concerns are surrounding their product with the EXTRA MARGIN of safety that Oakite materials provide. Risk of contamination is avoided by cleaning equipment FIRST . . . then killing bacteria by sterilizing with Oakite Bactericide.

Without obligation on your part and under actual plant operating conditions, let us demonstrate how Oakite materials can help you maintain more effectively, and economically a standard of sanitation that assures the dependable protection against contamination every food product deserves.

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OAKITE PRODUCTS, INC.
26G Thames St., New York, N. Y.

Branch Offices and Representatives in All Principal Cities of the U.S.

OAKITE
CERTIFIED CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

a meeting a proposal that a new machine be installed. He was armed with an array of convincing facts and figures, and urged the investment of several thousand dollars in the machine he wanted. He showed that he had made a careful study of the proposition and argued impressively in favor of an immediate purchase.

Several members of the board who are familiar with billing went into a huddle. I don't know how long they discussed the subject, but doubtless they went into every detail and eventuality. For when the recommendation was presented to the president it endorsed the proposition that the machine be put in on probation, explaining that the manufacturer undoubtedly would allow a trial without cost and that it be purchased if the improved facility and lower expense it provided justified the investment.

Also, during its first eighteen months, the board took a hand in the creation and introduction of new products with considerable success. It recommended a number of additions to our line of drug products, including insecticides, and suggested several changes in formulas which proved to be valuable.

Even when it was learning its way about, the board began to explore the attractive fields of advertising and merchandising. After one of its early meetings it offered suggestions to the advertising department for the creation of new plans to aid in selling slow-moving items.

It also expressed special interest in our line of products for household pets. We introduced the line about six years ago and thought we were doing a satisfactory business on it; but the board was not satisfied. After several discussions, the juniors recommended some changes in the line, and then suggested a special selling campaign which included the offer of prizes to retailers for exceptional window displays.

As with many other measures originating with it, the junior board recommended that this plan be tried out before its general adoption. So we arranged a special proposition for retail dealers which featured dog remedies, soaps, insecticides, bird food and the like, and put it up to Baltimore storekeepers. After a short time, members of the board checked up and found that we not only had procured a large number of window displays, but that the business on our pet products in the city had increased enormously. Then the junior board passed a recommendation to the effect that the plan be generally adopted.

AFTER THE BOARD had been functioning six or seven months, it furnished us with a surprise. Just why it turned its attention to our Canadian business I do not know; but evidently one of the members thought we could increase our trade with the Dominion. At any rate, the board passed a resolution that a certain official of the company be sent to Canada for three months as a sort of good will ambassador.

With the recommendation was a definite plan for building up the Canadian business. The basic idea was not so much the taking of orders as the creating of a better understanding and the establishment of more cordial relations with distributors. The ambassador made the trip, and the results have been exceedingly gratifying.

These, of course, are but a few of the activities of the junior board of directors during its first eighteen months of organization. It had recommended improvements and new methods in almost every avenue of the company's business, and had proved itself to be one of our most valuable assets. The board not only had been responsible for the abnormal gain in volume of business and profits, but it had pointed the way to many economies and more satisfactory ways of doing things. In the opinion of every official of the company, the board had established itself permanently as an important part of the business management. The results proved conclusively that the ideas of youth are invaluable to any business, and that the board plan of management had induced our young men to utilize vastly more than half of their mental capacity.

Stories of

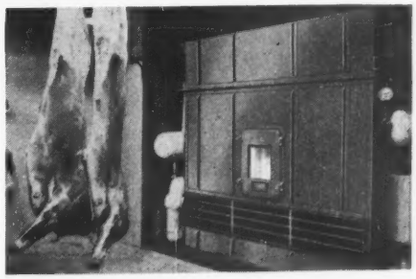
Vilter Refrigeration . . .

MYSTERY OF THE VANISHING MEAT

Mystery! Many Packers found hundreds of pounds of meat actually vanishing in a highly mysterious manner—in spite of storage doors securely locked and carefully guarded. *Shrinkage* was the thief! *Vilter Refrigeration Machinery is saving Packers hundreds of dollars every year, cutting their shrinkage losses, guarding their meat quality, color, and texture.*

KEEPING THE WRINKLE OFF THE SAUSAGE

A wrinkle has no place on sausages and frankfurters! The sausage maker came to Vilter long ago for a solution to this problem. Now Controlled Refrigeration and Air Conditioning keep sausages free from wrinkles, appetizing in color, appealing to the housewife.

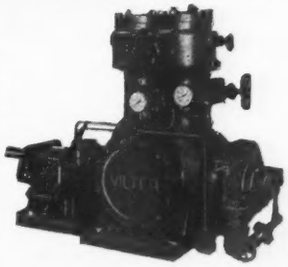


QUICK-FROZEN FRESH FOODS OUT OF SEASON

At last Mrs. Housewife can obtain garden-fresh vegetables, ripe-picked fruits out of season, with all, rich flavor and quality carefully preserved—by Refrigeration.

Quick-freezing fruits, vegetables, and meats have required careful study in methods and equipment by Vilter Refrigeration Engineers.

A fascinating history of modern refrigeration is written in Vilter files. Stories of difficult problems solved, new developments introduced, even new industries started, nurtured and helped to success through refrigeration. The fame of Vilter Equipment and Vilter Engineering is built on the final performance efficiency, the low maintenance, and easy, trouble-free service of thousands of successful installations.



• *Vilter Complete Refrigeration Equipment and Engineering service will help you to greater production and Profit on Food Processing.*

Superior Since 1867

VILTER

Refrigeration... Air Conditioning

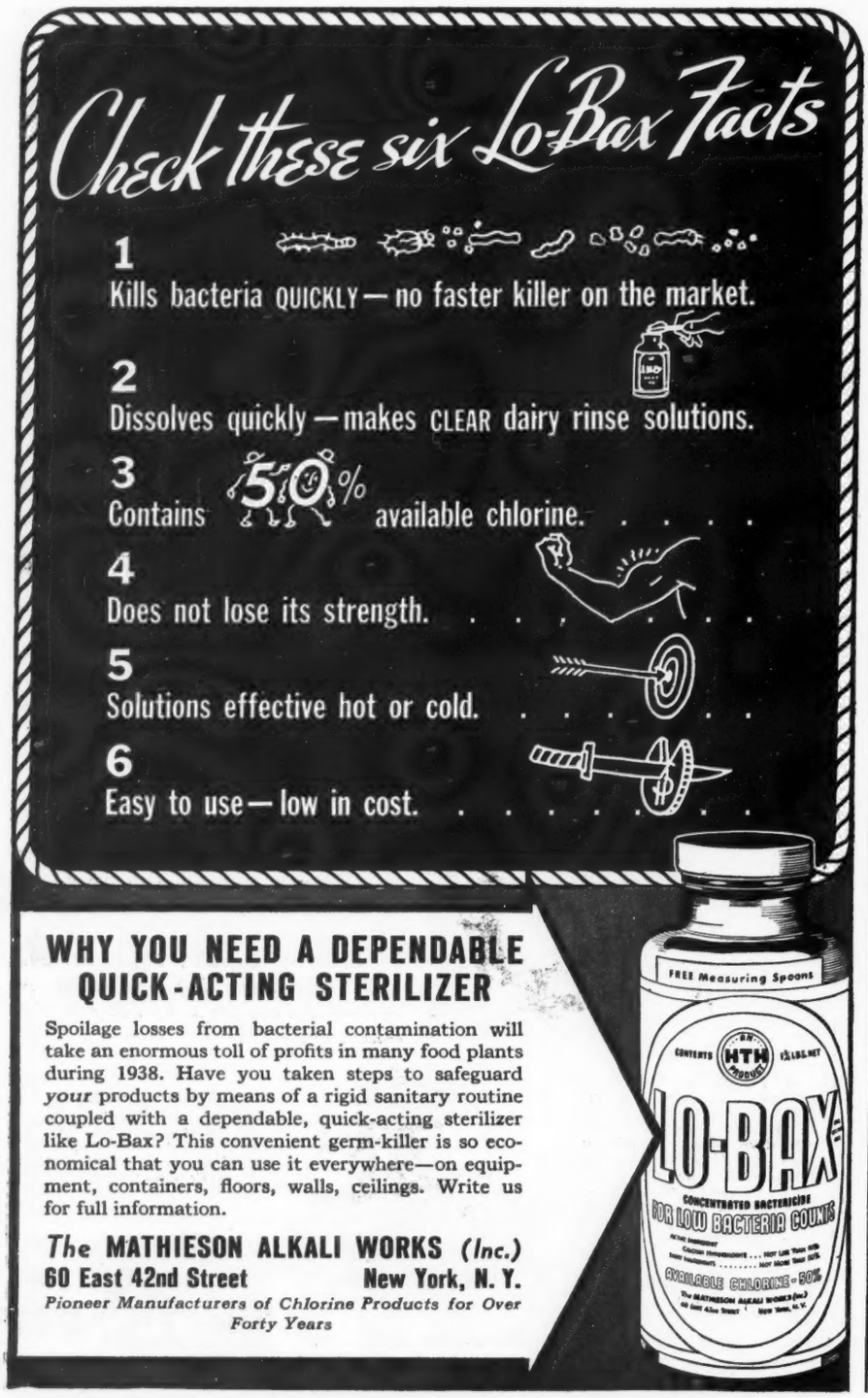
THE VILTER MANUFACTURING CO.
2217 South First Street Milwaukee, Wis.

CANNED FOODS

Concentrating Fruit Juice Without Jelling

FRUIT-JUICE CONCENTRATES, which have a thickened consistency but which do not jell, can be prepared by clarifying a portion of the juice before thickening. The preferred procedure, as disclosed in German Patent 657,696 (granted March 11, 1938, to Engelhardt & Co., K. G. vormals Kondima Fabrik Akt.-Ges. in Karlsruhe, Germany), is to clarify one portion of the juice (by enzyme treatment or any other suitable means), mix this portion with the remainder and concentrate by evaporation. The usual precautions are observed in thickening the juice by evaporation, greater or less care being required according to whether the juice is, or is not, sensitive to heat, atmospheric oxidation and other influences.

Another procedure is to evaporate the treated (clarified) and untreated portions separately and to mix the concentrates thus prepared. An added advantage of the process is that a fruit juice concentrate, which has been made from unclarified juice and has jelled, can be saved by restoring it to the desired liquid consistency. This is accomplished by mixing the jelled concentrate with juice which has been clarified but not evaporated.


Check these six Lo-Bax Facts
1
Kills bacteria QUICKLY — no faster killer on the market.
2
Dissolves quickly — makes CLEAR dairy rinse solutions.
3
Contains 50% available chlorine.
4
Does not lose its strength.
5
Solutions effective hot or cold.
6
Easy to use — low in cost.
WHY YOU NEED A DEPENDABLE QUICK-ACTING STERILIZER
Spoilage losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard your products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.
The MATHIESON ALKALI WORKS (Inc.)
60 East 42nd Street New York, N. Y.
Pioneer Manufacturers of Chlorine Products for Over Forty Years
FREE Measuring Spoons
HTH
LO-BAX
CONCENTRATED BACTERICIDE
FOR LOW BACTERIA COUNTS
AVAILABLE CHLORINE - 50%

CHOCOLATE

Porous Chocolate

ACCORDING TO French Patent 825,589 (granted March 7, 1938, to Frantisek Palik, Czechoslovakia), a porous chocolate preparation can be conveniently made by use of a powder which, though not of the same composition, has the same effect as baking powder. The gas-evolving ingredient may be ammonium carbonate, or a bicarbonate of potassium, sodium, lithium or magnesium.

The composition of the powder is selected to give the gas evolution when the material is heated, for example between 70 and 90 deg. C. (158 and 194 deg. F.). A chloride with sufficiently acidic action to liberate carbon dioxide from the carbonate or bicarbonate is added, together with a small amount of gliadin from wheat. As an example, a mixture is made of 100 parts milk chocolate, 2.5 parts soy bean lecithin, 0.4 part ammonium carbonate and 5 parts alcoholic gliadin solution (flour extract).

Because ammonium carbonate decomposes more easily than the other carbonates or bicarbonates, this mix does not require a chloride to facilitate gas evolution. The preparation is completed by heating the mix to 72 deg. C. (161 deg. F.) and then cooling quickly when the desired porosity is attained. Another mix which requires no added chloride, but must be heated to a higher temperature, contains 100 parts milk chocolate, 0.25 part soy bean lecithin, 0.6 part sodium bicarbonate and 2.8 parts wheat flour (to supply the gliadin). This preparation is heated to about 90 deg. C. (194 deg. F.), then cooled.

DAIRY PRODUCTS

Testing Milk

IN THE SERUM METHOD for examining milk, the customary calcium chloride serum has two disadvantages.

First, it is unreliable for sour milk because the serum is turbid, and precise refractometric readings are difficult or impossible to obtain. Second, it is prepared with the aid of heat, which coagulates heat-sensitive proteins and this alters the refractive index of the serum. A lead serum which needs no heating and gives perfectly clear serum, even with sour milk, is easily made by shaking 50 cc. milk with 25 cc. lead acetate solution and filtering the mixture. This improved test serum is useful for detecting milk from diseased cows, especially in case of udder inflammations.

The refractive index of lead serum tends to be higher than that of calcium chloride serum, and this difference is enhanced in numerous cases of diseased or even of healthy cows. For example, the difference is larger for colostrum than for the milk that follows it, probably because of a higher content of soluble proteins. Calcium chloride serum is not sensitive to changes in the soluble protein content of milk because these proteins are coagulated when the serum is prepared. Lead serum can be used to good advantage in testing milk for pasteurization effects (whether raw, or pasteurized by flash heating, or by more prolonged heating). Acidity (sourness of milk) does not impair its usefulness because the serum remains perfectly clear even when the milk is very sour.

Digest from "Refraction of Lead Serum From Milk," by E. Tellmann, *Osterreichische Chemiker-Zeitung* 41, 123, 1938 (Published in Vienna).

FATS & OILS

Continuous Fat Hardening

THE CONTINUOUS METHOD of hardening oils by hydrogenation, now operated in England by Technical Research Works, Ltd., merits close study because it should be able, with a few process improvements, to meet severe and exacting demands in the production of edible fats. A major advantage is that no powdered catalyst is used, so that filtration of the hydrogenated oil to remove nickel particles is unnecessary.

The continuous operating cycle comprises hydrogenating an oil at about 250 deg. C. (482 deg. F.), extracting fat from the spent catalyst, electrolytically oxidizing the catalyst to nickel oxide, and activating the catalyst by reducing the oxide to metallic nickel with hydrogen under pressure. The new continuous method permits easy control of composition, and hence quality, in the hardened oil. Decomposition of the oil, with liberation of free fatty acids, is avoided and so it is not necessary to neutralize the hardened fat with alkali.

Throughout the cycle the catalyst is a fixed, integral part of the apparatus because repeated regeneration, by the anodic oxidation method, makes it possible to use the same catalyst year after year with only slight loss. Since the oil is exposed to heat for only a short time there is no discoloration of the product. The operating cost for hardening oils is relatively low, partly because the apparatus is comparatively simple both in design and in operation.

Digest from "Continuous Process for Hardening Oils and Fats," by L. H. Manderstam, *Fette und Seifen*, 45 251, 1938 (Published in Germany).

GRAIN PRODUCTS

Ear Rot and Blue Eye in Corn

CORN, growing or in storage, is subject to ear rot caused by the growth of

Order this "economy-dividend" with your next refrigerated truck

This .24 extra-efficient insulation cuts down operating expense on every trip, all year 'round.

● If you're in business for profit, you must economize. Particularly necessary are operating economies. And every time you save operating expense, you pay yourself a yearly "economy-dividend." This is why so many truck operators use Dry-Zero insulation. It results in maximum refrigeration efficiency, at lowest possible expense.

Builders in the transportation field have accepted Dry-Zero as a standard of insulation efficiency. It is used in a majority of refrigerated motor trucks and in 8 out of 10 refrigerated railroad cars.

Over a million household refrigerators are also insulated with Dry-Zero. In every case of exacting demand for insulation efficiency and economy, Dry-Zero has won approval of engineer, builder, and user.

INSULATION PROTECTION—Maremont Automotive Products Co., Chicago, built this truck for Hertz Truck Lease Service, Chicago. Built to operate at normal temperatures, it is one of a fleet of 13. Dry-Zero insulation is used to prevent extreme temperature differences. Ask your body builder about Dry-Zero.

Here are six facts about insulation economy

1 The remarkable insulating efficiency rating of .24 has been awarded to Dry-Zero by several independent authorities, such as the U. S. Bureau of Standards.

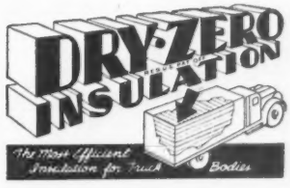
2 The high insulating efficiency of Dry-Zero means maximum protection against outside heat. It means temperatures are kept low over long periods of time at minimum refrigerating expense.

3 Furthermore, truck operators' records show that Dry-Zero keeps its insulating efficiency for the entire life of the truck. It is not ruined by moisture, settling, disintegration, or molds.

4 Dry-Zero is so light in weight that it adds little to the deadweight of the truck. This means greater payload capacity.

5 In addition, because of its insulating efficiency, less thickness is needed; therefore, walls can be thinner, making more room for cargo.

6 Dry-Zero is easy to install. You can order either Dry-Zero Blanket Insulation or Dry-Zero Sealpad Insulation cut to exact size.



DRY-ZERO CORPORATION • CHICAGO • TORONTO

a wide variety of molds and fungi. With "blue eyes," the molds grow between germ and outer seed coat.

For mold growth to occur, the corn must contain a certain percentage of moisture varying, according to the kind of mold, from about 14 to 23 per cent.

Commercial damage to the grain from rot does not occur until the percentage of moisture in the corn is 1½ to 2 per cent above that needed for the mold to grow.

Digest from "Fungus Growth in Shelled Corn as Affected by Moisture," by Benjamin Koehler, *Journal of Agricultural Research*, 56, 291, 1938.

MEAT PRODUCTS

Meat Proteins

THE FLESH of horses, sheep, geese and codfish contains certain proteins in complex combination with sugars. Analysis of numerous samples showed that complexes of this type occur most abundantly in horse meat, least abundantly in the flesh of geese. In the production of meat extract the first extracts are richer in extracted sugar than are the later extracts, but are still far below the meat itself (muscle fiber) in sugar content. The complex compound of sugar and protein is rather stable, being not more than partly dissociated to free protein and free sugar by treatment with hot urea solution, by digestion with pepsin or by the action of alkaline or acid solutions. This relative stability is related to the fact that when the protein of meat extract is fractionally precipitated the successive fractions are distinctly different in carbohydrate content.

The sugar most commonly occurring in meat is glycogen. Traces of glucosamine, a close relative of glucose, were found in the sample examined during the study of the protein-sugar complex. The sugar content of mutton and goose is so low that no significant amount was present either in the extract or in the muscle fiber itself. On the other hand, the extract protein from horse meat contains 0.9 per cent sugar, and as high as 2.5 per cent has been found in horse muscle fiber. The proportions of protein and sugar in the complex are not always the same, because different complexes are formed. The complex can be separated from meat by dialyzing and fractionally precipitating with acetone.

Digest from "Protein:Carbohydrate Symplexes in Meat Protein," by K. Beck and J. Schormuller, *Zeitschrift fur Untersuchung der Lebensmittel*," 75, 119, 1938 (Published in Germany).

Source of Bacterial Contamination of Beef

CONTAMINATION of beef with bacteria has been traced to the organisms from the hides of the animals, and these in turn originate in the soil of the feed lots. High pressure spray washing of the animals before the hide take-off markedly reduces the number of bacteria.

Some form of radiation has also been attempted as a control measure, but, though scientifically possible, has not yet been reduced to commercial practice.

Digest from "Eleventh Annual Report, Council for Scientific and Industrial Research," p. 55, 1937 (Published in Australia).

SUGAR

Sugars in Water Softeners

THE RECENT DISCOVERY of organic-base exchange reagents, for softening water

MAKE YOUR FUMIGATION PAY

Bigger Profits WITH LIQUID HCN

Good fumigation is more than a protective measure. It is a means of getting more profits out of your merchandise . . . fewer returns of insect-infested products . . . greater customer satisfaction and confidence in the quality of your merchandise.

LIQUID HCN, the all-purpose pest destroyer, is the most powerful of all fumigants—and the safest, because it can be applied from the outside of the plant or warehouse through a piping system. The operation is quick, clean, convenient, inexpensive, and leaves all food products entirely unaffected.

One flour producer eliminates his losses from insect infestation by fumigating his plant with LIQUID HCN four times a year—at an annual cost of 18/100 cent per barrel. Another producer of prepared cake and flour mixtures uses HCN in vacuum chamber fumigation and obtains a complete kill of all insects and their larvae at a cost of only 15/1000 cent per pound of packaged product!

Standardize on LIQUID HCN, the fumigant that is not only the most efficient and the cleanest, but also the lowest in cost. Write us, giving the dimensions of your mills and we will gladly send you an estimate of what it will cost to get complete insect control with LIQUID HCN.

AMERICAN CYANAMID & CHEMICAL CORPORATION

Insecticide Department

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

KANSAS CITY, MO., AZUSA, CALIF.

by an action similar to that of the zeolites now commonly used, has led to a special development in which sugars or starch are used in the preparation of the reagent. As the invention is disclosed in British Patent 472,404 (granted Oct. 21, 1937, to Eric L. Holmes and United Water Softeners Ltd., London), an aromatic amine such as meta-phenylenediamine is first caused to react with a sugar or with starch, and the reaction product is condensed with formaldehyde. Just as formaldehyde forms resins by condensation with other aromatic amines, so in this case also a resinous gel is formed. It has one important difference from most formaldehyde-amine resins, however, in that it dissolves in water.

The solution thus formed has the same power of exchanging ions which makes the zeolites useful in water softening. Suitable sugars for use in this synthesis include glucose, levulose, cane sugar and invert sugar. For example, meta-phenylenediamine (18 parts) is boiled 90 minutes with 15 parts glucose in 240 parts water, then mixed with 10 parts formaldehyde (40 per cent solution) and boiled again for 40 minutes.

The gel thus formed is dried, powdered, soaked in dilute alkali for sixteen hours and washed with distilled water. When used as a water softener this product serves the additional function of neutralizing any acidity which may be present in the water.

MISCELLANEOUS

Fluorine Ingestion

IN AUSTRALIA sheep have been fed 60 to 120 mg. of fluorine each day for three years with no apparent impairment of their general health. These sheep have a concentration of Fl. in their bones and teeth at least ten times that in the control animals, yet they grew normally.

Continual ingestion of 160 to 170 mg. per day results in still higher concentrations, but with harmful effects on health and growth. Results will be published later as a scientific paper.

From Eleventh Annual (1937) Report of the Council for Scientific and Industrial Research, Australia.

Decaffeinizing Coffee Without Organic Solvents

ACCORDING to a Norwegian invention (Norwegian Patent 59,180, granted March 28, 1938, to Werner Graf, of Oslo), caffein can be successfully removed from coffee *without the aid of organic solvents,* and hence without the necessity of removing the last clinging traces of solvent from the treated coffee. The expense of solvent recovery is also saved, and any fire hazard that may be involved in extraction with inflammable liquids is avoided.

Hot (but not boiling) water is used as the solvent. To avoid the loss of desirable components from the treated coffee, the aqueous extract is first treated with a solid adsorbent to remove the caffein. The extract is then drawn off from the solid (now containing the adsorbed caffein) and returned to the treated coffee so that all extracted substances other than caffein are restored to the decaffeinized coffee. The selective adsorption, upon which the invention depends, can be effected with the high grade decolorizing earths which find various other applications in processing food products, e.g., in bleaching oils.

NEW! A Starch SPECIFICALLY FOR PIE FILLINGS!

(The *only* starch made expressly for this purpose)

- SETS to a smooth, creamy body—firm, yet free from lumps and graininess.
- TASTELESS—has no taste of its own to detract from that of your flavorings. Accordingly, your pies have better flavor.
- REMAINS TRANSLUCENT, considerably enhancing the eye-appeal of the pie or pastry.
- CONFORMS to all Pure Food Regulations.

We invite your inquiries, and shall be glad to send you one or more trial bags on approval, from our nearest factory.

FOOD STARCH DIVISION

NATIONAL ADHESIVES CORP.
820 GREENWICH STREET, NEW YORK

BOOKS RECEIVED

THE CHEMICAL ANALYSIS OF FOODS. By Henry Edward Cox, London analytical and consulting chemist. Published by P. Blakiston's Sons & Co., Inc., 1012 Walnut St., Philadelphia, Pa., 1938. 321 pages; 5¾x8½ in.; cloth. Price $5.

Published primarily for use in the laboratory, this book is now in its second edition. In bringing the work up to date the author has paid particular attention to methods for the determination of preservatives, metallic impurities, fluorides and such substances as ascorbic acid and enzymes. The Lane-Eynon method for sugars has been included, together with the Polenske-Kirschner process as now standardized and the Hortvet process. More is also given on condensed milk and on jams, meat and fish products, milk, dried milk, eggs, infant foods and various food fats. The book, however, has been kept in concise form.

PRACTICAL PHYSIOLOGICAL CHEMISTRY—11th Edition. By Phillip B. Hawk and Olaf Bergeim. Published by P. Blakiston's Sons & Co. Inc., 1012 Walnut Street, Philadelphia, Pa. 1937. 968 pages; 9¼x6½ in.; waterproof cloth; price $8.

As its title implies, the latest revision of this famous book deals largely with practical laboratory methods in physiological chemistry. The current revision, the first since 1931, includes drastic revision of sixteen of the chapters in the light of the most recent scientific progress. And many authorities have participated in its preparation.

Its breadth of scope, its carefully prepared index, its appendix giving directions for the preparation of the many reagents used in physiological chemistry make it a very valuable book for any laboratory.

The chapter on vitamins and deficiency diseases ought to be in the hands of those who labor in the field of propagandizing by way of the vitamin. Advertising agencies: please note.

INTERNATIONAL TIN RESEARCH AND DEVELOPMENT COUNCIL. Second General Report, 1937. Published by the Council, 378 Strand, London, W.C.2. Available also at the American office of the Council, 146 Broadway, New York, N. Y. 69 pp. Free.

To one who is interested in the use of tin or tinplate in any phase of food manufacture, this pamphlet is stimulating reading. Because it is, however, only a report of the state of progress of the investigations, it does not contain the finished technical recommendations. But it does contain the list of references which the interested reader may consult for the published technical findings. Naturally the report covers far more than the food industries' uses of tin.

PATENTS

Puffed Cereal Product of Dry, Crisp Texture Made by Forcing Uncooked, Finely Divided Material Between Spaced Surfaces to Generate a High Temperature and Pressure Which Will Vaporize the Moisture and Disrupt the Starch Granules—Clair B. Mathews, Harry W. Adams and Earl E. Berry to Flakall Corp., Beloit, Wis. No. 2,120,138. June 7, 1938.

Cold, Fresh Fish Fillets Preheated and Given Preliminary Smoking by Contact With Air Used to Cool and Reduce Smoke of Hot Oversmoked Fillets and Then Subjected to Smoke to Produce a Hot Oversmoked Fish—Maurice L. Brenner and Victor Schwab, Monterey, Calif., to Sea Pride Packing Corp., Ltd. No. 2,120,237. June 14, 1938.

Wheat Tempered to Desired Moisture Content for Milling by Mechanical Means—Glen V. Feese, one-half to Kansas Milling Co., Wichita, Kans. No. 2,120,437. June 14, 1938.

Ripe Flesh of Papaya Fruit Treated With a Lime-Containing Liquid for a Period of Time Preliminary to Conversion Into Food Products of Any Desired Taste Flavor and Color—Theodoor Alexander de Neve, Batavia, Java, Dutch East Indies. No. 2,120,489. June 14, 1938.

Raw Tubers Shredded and Freed From Major Portion of Juice, Dried Without Destroying Coarse Physical Character of Shread; Extracted Juice Combined With Quantity of Cooked Tuber Material, and Dried—David Dalsey, Chicago, Ill. No. 2,120,777. June 14, 1938.

Zein Obtained in Concentrated Solution Without Change in Plasticity and With Reduced Oil Content—Lloyd C. Swallen, Pekin, Ill. to Corn Products Refining Co., New York, N.Y. No. 2,120,946. June 14, 1938.

Bakery Products Made From Laminations of Thin Strips of Dough Separated by Thin Layers of Filling—Kenneth D. Loose, Bronxville, N.Y. and Charles W. Watkins and Joseph W. Green, Dayton, Ohio to Loose-Wiles Biscuit Co., Long Island City, N.Y. No. 2,121,128. June 21, 1938.

Hard Candy Piece Having a Cavity and Unobstructed Opening Through Which Other Confectionery Material May Be Pumped Into Cavity—Clarence Lloyd Claff, Randolph, Mass. No. 2,121,185. June 21, 1938.

Sterile Milk Coagulated in Seven Hours With Five Per Cent Inoculation of Mixed Culture of Lactobacillus Acidophilus and of Streptococcus Thermophilus—Frederic W. Nordsiek, to The Sanoderm Co., Inc., New York, N.Y. No. 2,121,442. June 21, 1938.

Product Made to Contain Dispersed Butter Fat in Excess of 65 Per Cent of Total Weight—Herman D. Wendt, deceased, by Ada R. Wendt, administratrix, Coudersport, Pa., to Milk Processes Inc., Philadelphia, Pa. No. 2,121,896. June 28, 1938.

Starch—Containing Material Freed From Lipoid and Phosphorous Impurities Through Action of Nitric Acid in Water-Alcohol Solution—Karl Paul Link, Carl G. Niemann and Ray H. Roberts, to Wisconsin Alumni Research Foundation, Madison, Wis. No. 2,121,919. June 28, 1938.

Milk and Sugar Mixture Caramelized and Dried for Use in Manufacture of Chocolate Coating—William W. Stokes, to Washington Chocolate Co., Seattle, Wash. No. 2,122,016. June 28, 1938.

Ice Cream in Bar Form Mechanically Cut and Dispensed in Measured Slices—Benardus Hulskamp, Alkmaar, Netherlands. No. 2,122,523. July 5, 1938.

Milk Can Fitted With Mechanical Device for Easy Opening—John W. McFarland, St. Anthony, Idaho, to Easy Lift Lid Co. No. 2,122,618. July 5, 1938.

Starch From Corn Tabled at a Density Between 8 and 15 Deg. Be on Tables Inclined 5 In. in 110 Ft. Length for the 8 Deg. Be Density to 12 In. for the 15 Deg. Be Density—Frederick L. Jefferies, LaGrange, Ill., to International Patents Developments Co., Wilmington, Del. No. 2,122,647. July 5, 1938.

Beer and Ale Improved in Taste by Dializing a Fermented Wort Against an Unfermented Wort—John F. Silhavy, Saginaw, Mich. No. 2,122,761. July 5, 1938.

Wort in Two Vats Under Different Conditions Fermented by Interchanging the Yeast Removed From the Vats After Fermentation in Each Has Progressed to the Desired Stage—Borge Valdemar Hansen, Randers, Denmark, to Aktieselskabet Dansk Gaerings-Industri, Copenhagen, Denmark. No. 2,122,939. July 5, 1938.

Milk Sterilized Under Vacuum by Direct Contact With Steam—Charles E. Rogers, Detroit, Mich. No. 2,122,954. July 5, 1938.

Jelly Made and Molded in Continuous Manner—Albert Leo, deceased, by Mary Beck Leo, administratrix, Ontario, Calif. No. 2,122,982. July 5, 1938.

Food Waste With High Liquid Content Treated to Recover Solids in Dehydrated State Without Breaking Down Organic Constituents—John E. Rowland, Long Beach, Calif. No. 2,123,080. July 5, 1938.

Mash for Alcoholic Fermentation Made to Contain 4-6 Per Cent by Weight of Mono-Hexose Sugar, 0.1 Per Cent Ammonium Salt, 0.1 Per Cent Phosphoric Acid Salt and an Insoluble Alkaline Metal Carbonate 0.2 Per Cent by Weight in Excess of That Needed to Give a Hydrogen Ion Concentration of 6.2—John Müller, Philadelphia, Pa., to Commercial Solvents Corp., New York, N. Y. No. 2,123,078. July 5, 1938.

Food Materials Preserved by Dehydration and Put in Ribbon or Film Form by a Two-Step Process in a Non-Oxidizing Atmosphere—William W. Cowgill, Fairfield, Conn., to Sardik, Inc., Jersey City, N. J. No. 2,123,134. July 5, 1938.

Cheese Whey Converted Into a Dry, Stable Milk Product Comprised of Protein, Calcium, and Phosphorous; White in Color, Odorless and Free From Decomposition Products—Lloyd K. Riggs, Newark, N. J., and Forest H. Clickner, Chicago, Ill., to Kraft-Phenix Cheese Corp. No. 2,123,203. July 12, 1938.

Multi-Flavored Confections Molded and Frozen Onto Sticks Keeping the Portions of Different Flavors in Separate Layers—Norman M. Thomas, Brooklyn, N. Y., to Joe Lowe Corp., New York, N. Y. No. 2,123,215. July 12, 1938.

Pie Rims Crimped by Mechanical Means—Arthur E. Clark, Freeport, and John F. Kohler, New York, N. Y. No. 2,123,230. July 12, 1938.

Vegetable Oils Hydrogenated by Highly Purified Steam-Iron Hydrogen Gas Under Pressure at a Temperature Not Over 180 Deg. C. in Contact With a Metallic Catalyst—Truman M. Godfrey, Winchester, and William J. Paterson, Chestnut Hill, Mass., to Lever Brothers Co. No. 2,123,332. July 12, 1938.

FROZEN FOODS *Cabinet* DIRECTORY

No problem in the retail distribution of frozen foods has been more thorny than the problem of obtaining efficient low-cost cabinets for holding and displaying frozen foods in the retail store. Limited production has been a restraining influence in total distribution. The frozen food cabinet has been a limiting factor in retail store distribution.

CONSUMER ACCEPTANCE of frozen foods is not general. Even in those areas where frozen foods have been offered for sale for a number of years, frozen foods have obtained the acceptance of but a portion of the trade. There is still much pioneering to be done before frozen foods obtain the acceptance accorded other foods. The introduction of frozen foods in new areas and the creation of general consumer acceptance wherever frozen foods are offered for sale, depends in no small degree on the retailers who pioneer the merchandising of these new and, to most people, untried foods.

Retailers generally stock frozen foods for two reasons: They either expect from the sale of frozen foods a steady yearly profit or stock the frozen products to create store traffic. Stores handling only dry groceries and delicatessen products, have added frozen foods to their inventory to provide fresh meat and green goods for their customers without the expense of adding to their small stores a butcher department and a fresh fruit and vegetable stand. In each case, store traffic is a consideration but profits, direct or indirect, are the basic motive.

In the past, the initial cost plus the operating cost of the cabinet has often eaten up a sizable portion, if not all, of retailers' annual profits from the sale of frozen foods. In not a few cases, profit from increased store traffic alone has been the only profit accruing to the retailer.

There has been an urgent need in the retail distribution of frozen foods for less expensive and more efficient cabinets in which to hold and display the products. This need is being met by cabinet manufacturers and designers who have not only greatly improved the efficiency of their cabinets but have also greatly decreased the necessary initial retail store cabinet investment.

The initial cost, operating cost and efficiency of the retail cabinet are all very vital to frozen food distribution, regardless of who owns the cabinet or on what basis it is operated in the retail outlet.

Who shall own the cabinet, and whose and what products shall be sold from it, and at whose price shall the frozen products be sold, are still and probably always will be controversial questions in the retail distribution of frozen foods? Just as they are in the ice cream industry. As far as first cost, efficiency and operating cost of the cabinet are concerned, it makes little difference who owns it. It also makes little difference whether the cabinet is leased, rented or loaned, dealer-owned, distributor-owned or distributor-financed—all cabinet costs are a part of distribution cost and must be covered in the spread between manufacturer and consumer.

Another subject of controversy is whether or not the cabinet should be constructed for visual display of the frozen products. The answer seems to be, "it depends." The opinion of distributors is divided, as well as that of retailers. Some consider the additional cost of visual display justified, others disagree. Many retailers consider visual display important and even necessary during the introductory periods in establishing acceptance in a new territory. Other retailers claim the visual display cabinet does not justify the additional cost in a market where acceptance has been established. Still other retailers insist that the point of sale display value of the cabinet built for visual inspection of frozen food products justify the additional cost.

The minimum average monthly turnover that admits of retailer profit is another question which depends for answer largely on the frozen food cabinet. Here again, retailers disagree. Apparently, initial and operating costs should fit the turnover. The small solid carbon dioxide refrigerated cabinet promises to extend the minimum limit of profitable sales of frozen foods. Small retailers, with a frozen food sales volume too small to eke out a profit over the cost of amortizing and operating a large, and to them expensive, mechanical cabinet have reported profitable and satisfactory results in some areas using small cabinets, refrigerated by solid carbon dioxide. Some are successfully using the ice cream cabinet.

It is no secret that a considerable volume of consumer packages of frozen foods has been "boot-legged" by drug stores and similar outlets, especially in areas where retail grocery outlets have not yet been established. These frozen foods have been held

in storage at low temperatures in the drug store's ice cream cabinets.

There is little data on which to base an estimate of the demand for frozen food cabinets during 1939. However, the opinion of those well informed may be of interest. These estimate an increase of retail outlets varying from 50 per cent up. Optimistic estimates place the retail outlets for frozen foods at the end of 1939 between 15,000 and 25,000, with an accompanying investment in cabinets somewhere between five and ten million dollars.

FOOD INDUSTRIES is attempting with the accompanying directory to furnish food manufacturers and distributors with data on the frozen food cabinets available at this time for their use. To obtain this data, questionnaires were mailed not only to those manufacturers known to be manufacturing frozen food cabinets, but to all others who might either be expected to manufacture frozen food cabinets or who might be contemplating manufacturing them.

This directory cannot be complete because manufacturers not previously engaged in building frozen food cabinets are now designing cabinets which will appear on the market during the next year. These obviously could not return the data requested on the questionnaire. A request for photographs was included in the mailing of questionnaires. Some manufacturers responded with several photographs, others returned none. This accounts for the fact that some cabinet manufacturers' cabinets may appear more than once while others appear not at all. Detailed drawings and blueprints were requested as a part of the questionnaire. So few manufacturers supplied either blueprints or drawings that these have been omitted.

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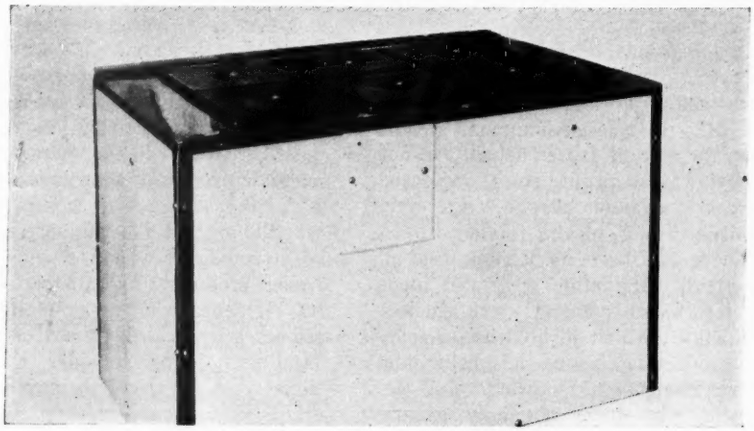
STANDARD BODY CORP., 430 East 104th Street, New York City

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
MZ	30" L 30" W 37" H	7.2	Approx. 400	—15° and up	Yes	Direct expansion	Optional	Plate	⅓	Varies	Metal	Enamel	Cork	4"	Lids	No	No
SZ	30" L 30" W 48" H	10.2	Approx. 525	—15° and up	Yes	Direct expansion	Optional	Plate	⅓	Varies	Metal	Enamel	Cork	4"	Lids	No	No
PZ	30" L 30" W 60" H	13.2	Approx. 600	—15° and up	Yes	Direct expansion	Optional	Plate	⅓	Varies	Metal	Enamel	Cork		Lids	No	No
TZ	30" L 30" W 71" H	16.2	Approx. 690	—15° and up	Yes	Direct expansion	Optional	Plate	⅓	Varies	Metal	Enamel	Cork	4"	Lids	No	No
XZ	30" L 30" W 82" H	19.2	Approx. 765	—15° and up	Yes	Direct expansion	Optional	Plate	⅓	Varies	Metal	Enamel	Cork	4"	Lids	No	No

Standard Body Corp.

STANDARD BODY CORP.'S frozen food cabinets are of metal construction, enamel finished, with frozen food storage capacity ranging from 7.2 to 19.2 cu.ft. Access to the food storage compartments is through lift lids.



Frozen food cabinet by Standard Body Corp.

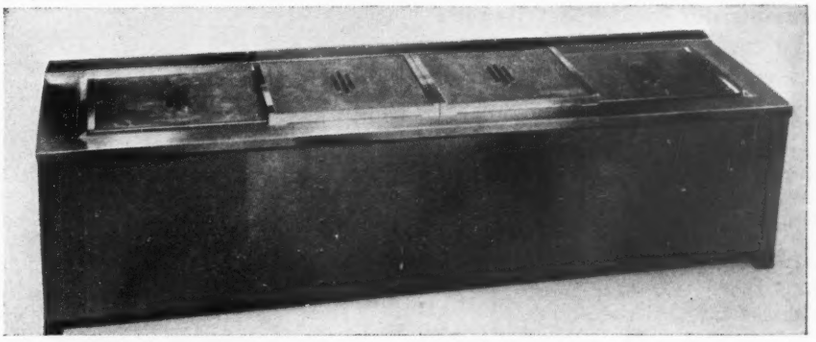
M. H. ACKERMAN, 320 Dickson Avenue, Mansfield, Ohio

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
44	Length to suit capacity 31" W 32" H	20 to 80 cu.ft.	Depends on size	−15° to 38°	Yes	Dry — full flooded evaporator	Ammonia F. — 12 methyl chloride	Hollow Plates	Depends on size	.....	All steel	Stainless steel	Cork	4" (bottom & asphalt)	Gliding covers	.....	.....

M. H. Ackerman

THE ACKERMAN CABINET employs a full-flooded evaporator which concentrates all refrigerating effect at the top of the cabinet. The cabinet has an all-steel frame and stainless steel sides. It maintains a temperature as low as −15 F. Sliding covers on the top permit access to the cabinet and visible inspection of contents. The top evaporators allow minimum loss of heat on opening.

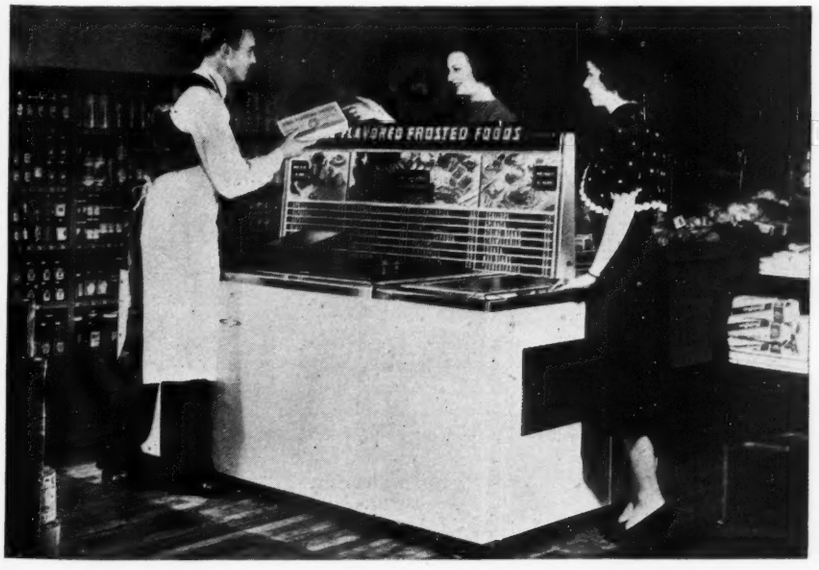


Frozen food cabinet by M. H. Ackerman Co.

FRIGIDAIRE DIVISION, G. M. S. Corp., Taylor Street, Dayton, Ohio

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt-Hours (Average Consumption per 24 Hours)	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
P-30	64 7/8" L. 30 1/8" W. 54 1/4" H.	10.04	805 lbs.	.....	Yes	Direct expansion	Freon 12	Copper coil soldered storage compartment wall	1/3 h.p. special refrigeration duty	Varies depending on operating conditions	Metal and wood	Stainless steel top — Dulux finish on sides and ends	Vegetable corkboard	4"	Lids on top	No	No
P-40	77 1/4" L. 30 1/8" W. 54 1/4" H.	13.74	1036 lbs.	.....	Yes	Direct expansion	Freon 12				Metal and wood		Vegetable corkboard	4"	Lids on top	No	No
P-60	102" L. 30 1/8" W. 54 1/4" H.	20.61	1295 lbs.	.....	Yes	Direct expansion	Freon 12				Metal and wood		Vegetable corkboard	4"	Lids on top	No	No



Frozen food cabinet Frigidaire Division, G. M. S. Corp.

Frigidaire Company

FRIGIDAIRE manufactures three models of frozen food cabinets. Access to the food compartment of these cabinets is through "Flip-Flop" lids of black porcelain on steel built with a soft rubber edge for sealing. The top is of stainless steel. The side and end panels are Bonderized, Duco finished. These cabinets are equipped with temperature control enabling the operator to make minor temperature adjustments without calling the service man. They come with or without double-faced boards with space for display advertising and for listings of frozen products and prices.

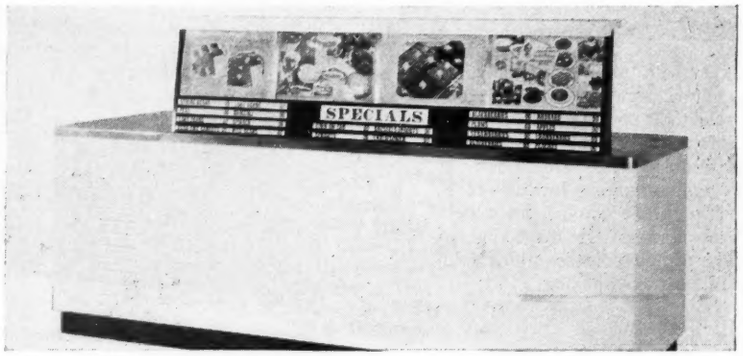
ALLIED STORE UTILITIES CO. (Hussmann-Ligonier Commercial Refrigerators), 2401 West Leffingwell Avenue, St. Louis, Missouri

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
FFS-100	100″ L 32″ W 34″ H	16	.....	.....	Yes	Direct expansion	.....	Coils	.....	.....	Metal	"Bondurbrite"	Corkboard	4½″	Double lids and gasket doors	No	No
Display	144″ L 34½″ W 50¾″ H	.....	.....	.....	Yes	Direct expansion	.....	Plate coils	.....	.....	Stainless steel	Porcelain	Corkboard	5″	Hinged doors and 16 metal drawers	Yes	....

Hussmann-Ligonier Refrigerator

THE HUSSMANN-LIGONIER cabinet is made of heavy gage metal with a white "Bondurbrite" finish in front, black finish on back. The top finish is of heavy gage stainless steel. The galvanized metal interior is partitioned into four compartments, 21 in. wide, 60⅜ in. long, 10 in. deep. Four galvanized trays, on ball bearing sleeves, operate on tracks welded to the inside metal lining. The two sets of double lids are of stainless steel exterior with black "Bondurbrite" metal on the inside and door edges. Doors are equipped with heavy cushioned gaskets. The cabinet is equipped with a lighted top display frame of steel.

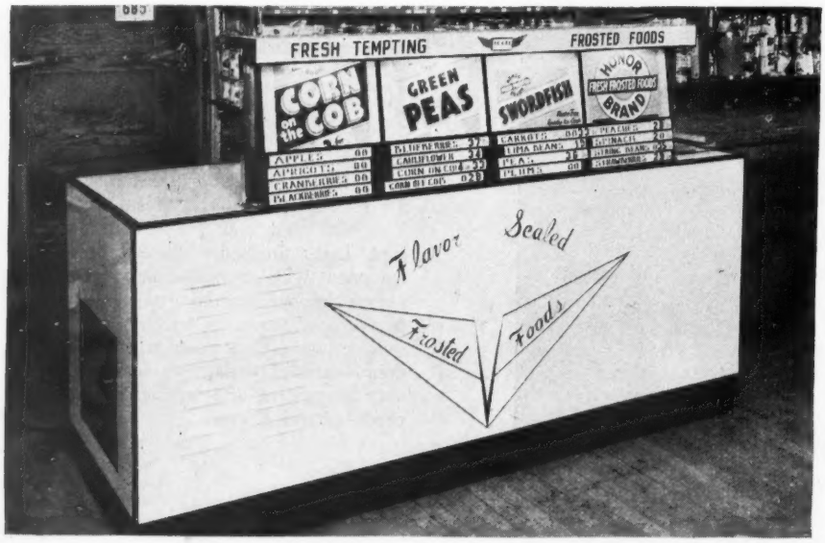


Frozen food cabinet by Hussman-Ligonier Refrigerator Co.

FOGEL REFRIGERATOR CO., 16th and Vine Streets, Philadelphia, Pennsylvania

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
8′ F-83	83″ L 30″ W 30″ H	13	875	−20° to 40° F.	Yes	Direct expansion	Methyl chloride or Freon	Plate	⅓	.340	Metal	Porcelain	"Aemeok" cork	4″ sides, 5″ bottom	Door and interior drawers	No	....
12′ F-83	107″ L 30″ W 30″ H	20	1150	−20° to 40° F.	Yes	Direct expansion	Methyl chloride or Freon	Plate	⅓	.385	Metal	Porcelain	"Aemeok" cork	4″ sides, 5″ bottom	Door and interior drawers	No	....
8′ D. S.	83″ L 30″ W 30″ H	13	850	−20° to 40° F.	Yes	Direct expansion	Methyl chloride or Freon	Plate	⅓	.340	Metal	Porcelain dulux	"Aemeok" cork	4″ sides, 5″ bottom	Door and interior drawers	No	....
12′ D. S.	107″ L 30″ W 30″ H	20	1100	−20° to 40° F.	Yes	Direct expansion	Methyl chloride or Freon	Plate	⅓	.385	Metal	Porcelain dulux	"Aemeok" cork	4″ sides, 5″ bottom	Door and interior drawers	No	....



Frozen food cabinet by Fogel Refrigerator Co.

Fogel Refrigerator Co.

FOGEL CABINETS are designed with self-contained compressor or remote compressor. These cabinets vary from 13 cu.ft. to 20 cu.ft. with a capacity for from 250 to 450 lb. of frozen foods. The chamber for storing food is divided into an upper and a lower section. Each section is divided into three storage compartments. The upper section is equipped with sliding receptacles 18 in. long, 12 in. high each one conatining three compartments. Access to food chamber is through four 19½ by 12¼ inch openings which are covered by hinged lids. A lighted display board 60x17 in. on the front of the cabinet lists frozen foods and prices and provides space for advertising displays.

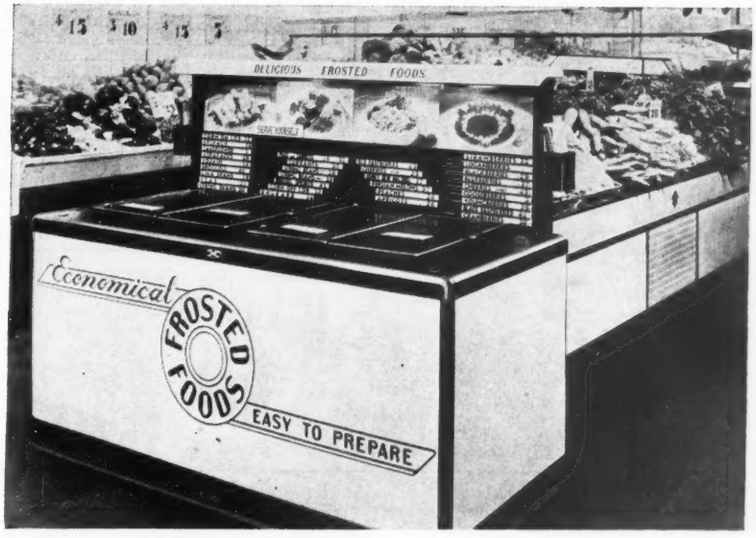
C. V. HILL & CO., INC., 360 Pennington Avenue, Trenton, New Jersey

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
65 FF	65½" L. 29¾" W. 30" H.	13.5	975 lbs.	0°F. to 10°F.	Yes	Direct expansion	Methyl chloride	Plate	¼	Approx. 3	Steel frame	Porcelain	Balsam wool	4¼" to 5¼"	Topservice lids	No	No
83 x F	84" L. 29¾" W. 30" H.	13.5	1075 lbs.	0°F. to 10°F.	Yes	Direct expansion	Methyl chloride	Plate	⅓	Approx. 3	Steel frame	Porcelain	Balsam wool	4¼" to 5¼"	Top service lids	No	No
90FF	90" L. 29¾" W. 30" H.	19.5	1300 lbs.	0°F. to 10°F.	Yes	Direct expansion	Methyl chloride	Plate	⅓	Approx. 4	Steel frame	Porcelain	Balsam wool	4¼" to 5¼"	Top service lids	No	No
2010	72" L. 35" W. 40" H.	20.695	1700 lbs.	0°F to 10°F.	Yes	Direct expansion	Methyl chloride	Plate	½	Approx. 5	Wood frame	Porcelain	Sheet cork	4½" to 5"	Service lids doors and drawers	Yes	3

C. V. Hill & Co., Inc.

C. V. Hill & Co. manufactures frozen food cabinets with or without visible display. Access to those cabinets without visible display is through black hard-rubber molded lids, gasketed with sponge rubber. Access is from top to bottom. The storage space below the upper trays is reached by pushing aside one of the upper trays which slide on ball bearing rollers. Access to the upper storage chamber of the visible display cabinet is from above. The display compartment is separate from the remainder of the cabinet. Access to the storage chamber below is from the back. All cabinets are equipped with a safety signalling device which flashes red, giving warning in ample time in case of failure of refrigeration. Cabinets without visible display are equipped with lighted boards for advertising display and listings of frozen foods and prices.

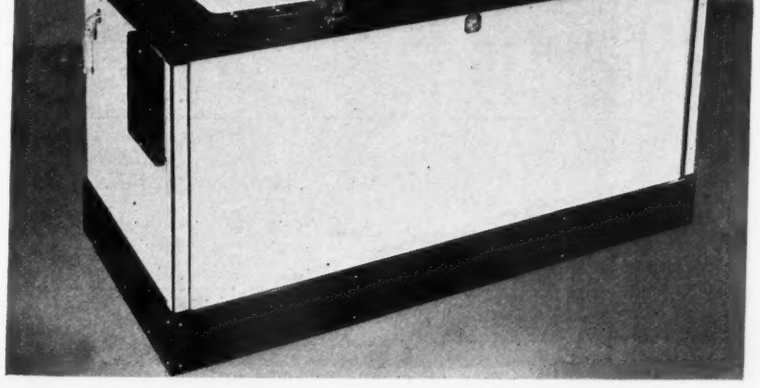


Frozen food cabinet by C. V. Hill & Co., Inc.

ED FRIEDRICH SALES CORP., San Antonio, Texas

DESIGNED FOR USE IN RETAIL STORES

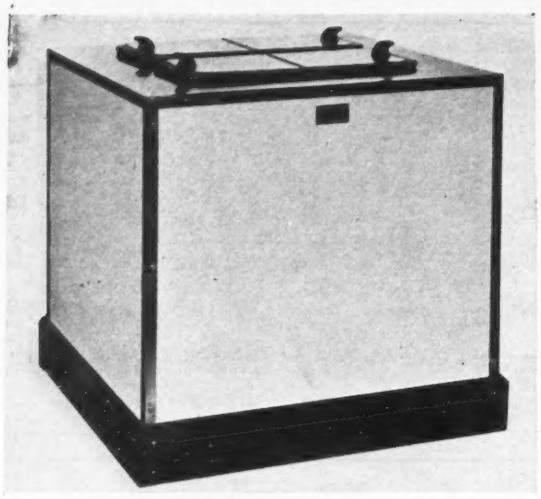
Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
6' Freezer	71¾" L 36⅞" W 36" H	18	.....	0° F. and up	Yes	Calcium chloride brine	.....	Coil	⅓	.....	Iron	Porcelain	Sheet cork	3"	Door and interior cabinets	No	No

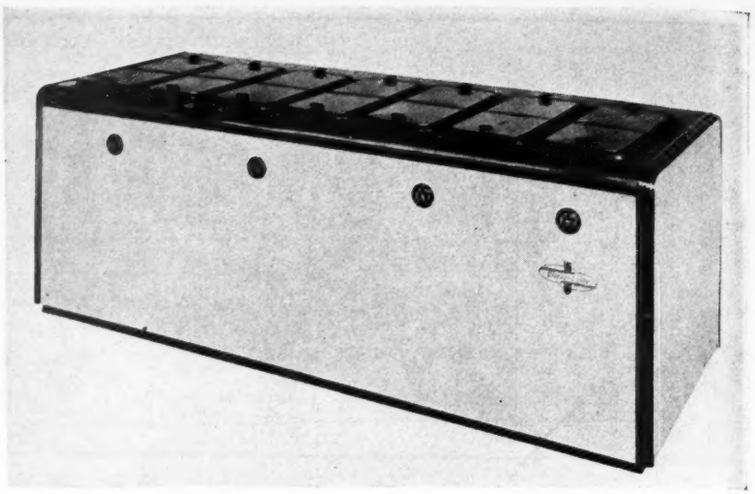


Frozen food cabinet by Ed. Friedrich Sales Corp.

Ed. Friedrich Sales Corp.

The Friedrich frozen food cabinets have 18 cu.ft. capacity and operate at temperatures as low as 0 deg. F. Access to the Friedrich cabinet is from the top through porcelain lifting lids. Cabinets are of white porcelain trimmed with black.





Frozen food cabinet by Mills Novelty Co.

Mills Novelty Co.

MILLS NOVELTY CO. manufactures six frozen food cabinets with frozen food storage capacities varying from 7 to 21½ cu.ft. The temperature range of these cabinets is down to –22 deg. F. Access to the storage compartment of the cabinets is through top openings and hinged doors. Uniform temperature is obtained through forced air circulation within the cabinet.

MILLS NOVELTY CO., 4100 Fullerton Avenue, Chicago, Illinois

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
R001040	67⅞″ L. 35⅝″ W. 33½″ H.	14.3	1005	−22°F to 40°F.	Yes	Direct expansion	Methyl chloride	Open coils forced air circulation	1	12	Metal	Baked Enamel	Temlock	5″ 4″ 2½″	Top opening	No	No
R001060	91⅞″ L. 33⅝″ W. 33½″ H.	20	1305	−22°F. to 40°F.	Yes	Direct expansion	Methyl chloride	Open coils forced air circulation	1	12	Metal	Baked enamel	Temlock	5″ 4″ 2½″	Top opening	No	No
G	80½″ L. 34½″ W. 32¾″ H.	20.3	1270	Not variable	Yes	Direct expansion	Methyl chloride	Coils in hold-over slab	½	6	Metal	Baked enamel	Temlock	5″ 4″ 2½″	Top opening	No	No
X	34¾″ L. 34½″ W. 32¾″ H.	6.8	475	Not variable	Yes	Direct expansion	Methyl chloride	Coils in hold-over slab	¼	3	Metal	Baked enamel	Temlock	4″ 3″ 2″	Top opening	No	No
X1	56¼″ L. 34½″ W. 32¾″ H.	14.3	925	Not variable	Yes	Direct expansion	Methyl chloride	Coils in hold-over slab	⅓	4	Metal	Baked enamel	Temlock	4″ 3″ 2″	Top opening	No	No
X2	80½″ L. 34½″ W. 32¾″ H.	21.5	1300	Not variable	Yes	Direct expansion	Methyl chloride	Coils in hold-over slab	½	6	Metal	Baked enamel	Temlock	4″ 3″ 2″	Top opening	No	No

CONTINENTAL CORPORATION, Fond du Lac, Wisconsin

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
F. S. 506	60″ L 29″ W 31″ H	6.5	.....	.....	Yes	Direct expansion	Freon 12	Coils	¼	.....	.....	.....	.....	.....	Top lids with hinged openings	No	No
No. 650	60¼″ L 29¼″ W 31⅝″ H	.....	.....	.....	Yes	Direct expansion	Freon 12	Copper tubing	¼	.....	Steel	Duluxe	Balsam wool	4″	Top hinged lids	No	No
No. 74	62″ L 31¼″ W 30″ H	7.4	.....	.....	Yes	Direct expansion	Freon 12	Copper tubing	¼	.....	Steel	Duluxe	Balsam wool	4″	Top hinged lids	No	No

Continental Corporation

THE CONTINENTAL CORPORATION cabinets for frozen foods are equipped with tell-tale lights which flash when the temperature rises and approaches the danger zone. Access to the frozen food storage compartments is through the top through lift lids. The baked enamel finish is white trimmed in black, top panels are black masonite and bandings for top panel are stainless steel.

RALPH V. GRAYSON, P. O. Box 939, Houston, Texas

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
Storage Cabinet	To specifications	To specifications	.....	Optional	Yes	Solid CO_2	.....	Coils	.....	.....	Metal	Enamel	Cotton	Optional	.....	No	No
Display Cabinet	To specifications	To specifications	.....	Optional	Yes	Solid CO_2	.....	Coils	.....	.....	Metal	Enamel	Cotton	Optional	Drawer	Yes	3

Ralph V. Grayson

RALPH V. GRAYSON builds to specifications frozen food cabinets with or without glazed windows for visual inspection of the product, and with an optional controlled temperature range. Grayson cabinets are of metal construction, enamel finished and refrigerated with solid carbon dioxide.

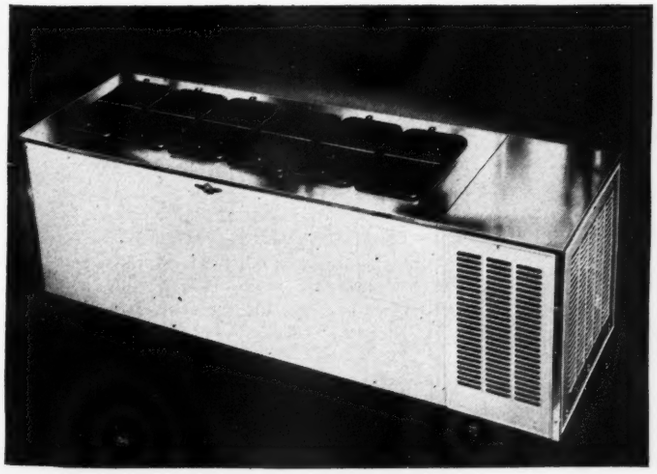
ANHEUSER-BUSCH, INC., St. Louis, Missouri

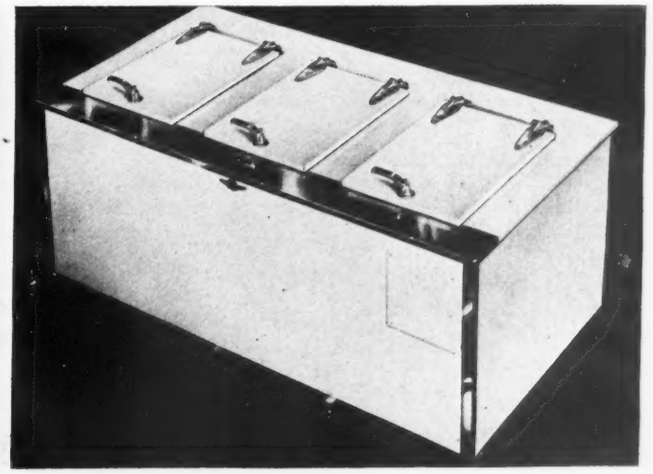
DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
ABCO	22¼" L 31" W 51⅛" H	6.2	593	−5° to −20°	Yes	Direct expansion	Methyl chloride	Copper coils	¼	.....	Steel	Dulux baked enamel	Corkboard	3½" sides and ends 4" bottom 2" top	Hinged or round lids optional	No	No
ABCO	34⅜" L 31" W 62⅞" H	9.4	757	−5° to −20°	Yes	Direct expansion	Methyl chloride	Copper coils	⅓	.....	Steel	Dulux baked enamel	Corkboard	3½" sides and ends 4" bottom 2" top	Hinged or round lids optional	No	No
ABCO	48⅝" L 31" W 74⅜" H	13.3	867	−5° to −20°	Yes	Direct expansion	Methyl chloride	Copper coils	⅓	.....	Steel	Dulux baked enamel	Corkboard	3½" sides and ends 4" bottom 2" top	Hinged or round lids optional	No	No
ABCO	57½" L 31" W 85⅞" H	15.7	985	−5° to −20°	Yes	Direct expansion	Methyl chloride	Copper coils	⅓	.....	Steel	Dulux baked enamel	Corkboard	3½" sides and ends 4" bottom 2" top	Hinged or round lids optional	No	No
ABCO	69⅛" L 31" W 97⅜" H	18.8	1167	−5° to −20°	Yes	Direct expansion	Methyl chloride	Copper coils	⅓	.....	Steel	Dulux baked enamel	Corkboard	3½" sides and ends 4" bottom 2" top	Hinged or round lids optional	No	No
Standard 145	37¼" L 45¾" W 33⅞" H	10.5	810	−5° to −20°	Yes	Direct expansion	Methyl	Coils	⅓	.....	.....	"Marlite"	Corkboard	4"	Lids	No	No
Standard 145	61¼" L 45¾" W 33⅞" H	21.4	1195	−5° to −20°	Yes	Direct expansion	Methyl	Coils	½	.....	.....	"Marlite"	Corkboard	4"	Lids	No	No
Standard 145	85¼" L 45¾" W 33⅞" H	32.3	1555	−5° to −20°	Yes	Direct expansion	Methyl	Coils	½	.....	.....	"Marlite"	Corkboard	4"	Lids	No	No
Standard 1 45	109¼" L 45¾" W 33⅞" H	43.2	1930	−5° to −20°	Yes	Direct expansion	Methyl	Coils	¾	.....	.....	"Marlite"	Corkboard	4"	Lids	No	No
Standard 145	133¼" L 45¾" W 33⅞" H	54.1	2298	−5° to −20°	Yes	Direct expansion	Methyl	Coils	¾	.....	.....	"Marlite"	Corkboard	4"	Lids	No	No

Anheuser-Busch Co.

ANHEUSER-BUSCH manufactures a large number of cabinets for frozen food storage, ranging in capacity up to 54 cu.ft. frozen food storage space. These cabinets may be operated at temperatures from 5 to 20 deg. below zero F. Model "Standard 145" has "Marlite" paneling on all sides and ends. The top is white with Monel threshhold plate in front of openings. Access to this cabinet is through single rabbeted type 18-in. wide lids covered with auto-body steel. "Statite" lever lid locks are equipped for counter-weights for automatic door closer. Model "ABCO" cabinets are paneled with Bonderized auto-body steel panels finished with baked enamel. Top is of Monel metal. Access to this cabinet is through molded rubber hinged lids with soft flexible edges assembled with Monel metal hinge. Lids have Monel bottoms and solid rubber lifting knobs.





Frozen food cabinet by Anheuser-Busch, Inc.

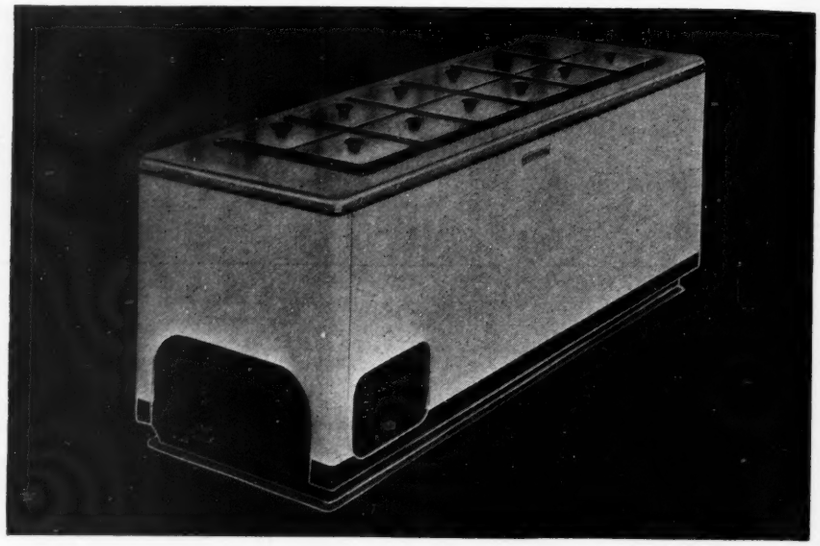
NASH-KELVINATOR CORP., 14250 Plymouth Rd., Detroit, Michigan

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
56849	51" L 33⅛" W 34⅝" H	3.461	850	.....	Yes	Direct expansion	Tubing	Coils	.....	.....	Monel metal	.....	Cork	4"	Lids	No	No
56850	62⅛" L 33⅛" W 34⅝" H	5.222	990	.....	Yes	Direct expansion	Tubing	Coils	.....	.....	Monel metal	.....	Cork	4"	Lids	No	No
56851	74½" L 33⅛" W 34⅝" H	3.461	1220	.....	Yes	Direct expansion	Tubing	Coils	.....	.....	Monel metal	.....	Cork	4"	Lids	No	No
56852	96⅞" L 33⅛" W 34⅝" H	5.222	1560	.....	Yes	Direct expansion	Tubing	Coils	.....	.....	Monel meta	.....	Cork	4"	Lids	No	No

Nash-Kelvinator Corp.

NASH-KELVINATOR manufactures a number of cabinets suitable for frozen food storage, ranging in capacity from 2 cu.ft. to more than 20 cu.ft. storage space. Access to these cabinets is through the top by means of lifting lids made of black rubber with monel metal facing top and bottom. The top of cabinet sare of monel metal. Cabinets are of one peer exterior metal. Cabinets are of one piece exterior 18 gage sheet steel bonderized inside and out.



Frozen food cabinet by Nash-Kelvinator Corp.

CHARLES Q. SHERMAN CO., 11 West 42d Street, New York City

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
59	68" L. 35" W 49¾" H.	500 (lbs. of food) 23 cu. ft.	1200	0	Yes	Direct expansion	Methyl and Freon	.....	⅓	Approx. 7.7	Steel	Porcelain	Cork	4"	.....	Yes	4
100	72" L. 35" W. 34" H.	500 (lbs. of food) 23 cu. ft.	1250	0	Yes	Direct expansion	Methyl and Freon	.....	⅓	Approx. 7.7	Steel	Porcelain	Cork	4"	.....	Yes	4
DESIGNED ESPECIALLY FOR INSTITUTIONAL USE																	
100	75" L. 35" W. 34" H.	475 (lbs. of food) 23 cu. ft.	1050	0	Yes	Direct expansion	Methyl and Freon	.....	⅓	Approx. 7.7	Steel	Porcelain	Cork	4"	Drawer	No	No

Frozen food cabinet by Charles Q. Sherman Co.

Charles Q. Sherman Co.

THE CHARLES Q. SHERMAN "Frostfood Displayor" cabinets, one of which has an automatic vending unit for self service, are of steel construction, porcelain finished. The cabinets for retail store use come equipped with four dead air space windows in the front for visual inspection of the frozen products. These cabinets are equipped with lighted display space for listing and pricing products.

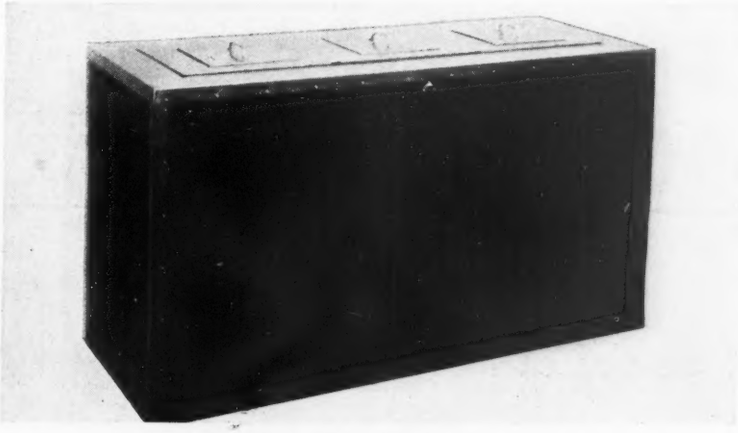
WALTHAM SYSTEM, INC., 277 Military Road, Buffalo, New York

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
F	53″ L 19½″ W 29″ H	17.3	265 (lbs. of food)	5° to 14°	Yes	Waltham cartridges	.....	.....	Non-mechanical	.....	Metal	Aluminum	Cork	4″	Top lids	No	No

Waltham System, Inc.

THIS FROZEN FOOD CABINET depends for refrigeration on "Waltham cartridges." The Waltham cartridges are frozen in the same room where frozen foods are stored and are transported to the retail cabinet with the delivery of frozen foods. Frozen at a temperature of 5 deg. F., they furnish refrigeration for the frozen food cabinet at a temperature between 5 and 16 deg. F. for a period of 24 hours.



Frozen food cabinet by Waltham System, Inc.

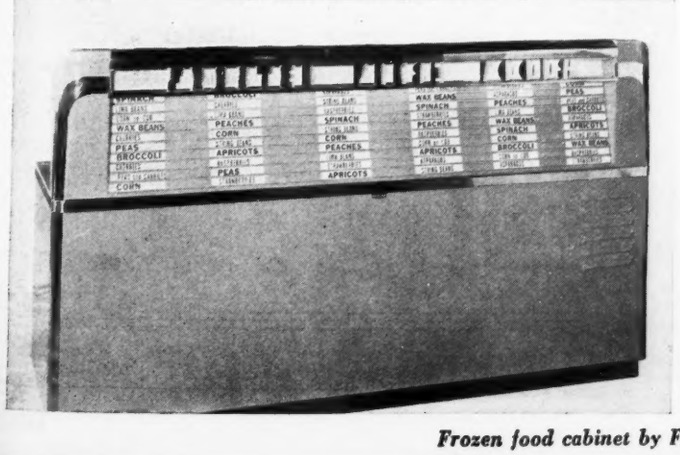
FROSTED CABINETS, INC., Decatur, Illinois

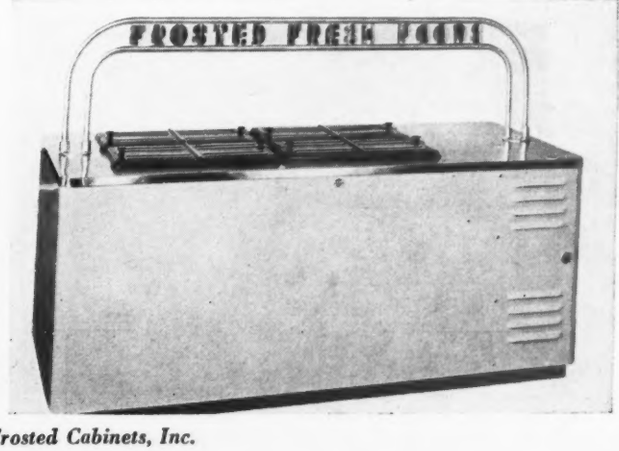
DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt-Hours (Average Consumption per 24 Hours	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
ZR #2	60¼″ L. 32⅝″ W. 32″ H.	150 (lbs. of food)	650	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	2 double hinged lids	No	No
ZR #2-R	39½″ L. 32⅝″ W. 32″ H.	150 (lbs. of food)	635	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	2 double hinged lids	No	No
ZR #4	76¼″ L. 32⅝″ W. 32″ H.	282 (lbs. of food)	975	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	4 double hinged lids	No	No
ZR #4-R	62¼″ L. 32⅝″ W. 32″ H.	282 (lbs. of food)	905	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	4 double hinged lids	No	No
ZR #6	99½″ L. 32⅝″ W. 32″ H.	414 (lbs. of food)	1175	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	6 double hinged lids	No	No
2R #6-R	86″ L. 32⅝″ W. 32″ H.	414 (lbs. of food)	1165	below 7°F	Yes	Direct expansion	.....	.....	.....	.....	Metal	Enamel	Cork	4¾″ side-walls 5″ bottom	6 double hinged lids	No	No

Frosted Cabinets, Inc.

"FROSTO" CABINETS are especially designed and built for self-service. The hard rubber lids with soft rubber sealing edges provide space for removable celluloid tabs for labeling the contents under each lid. Frozen food packages are carried in tinned wire baskets divided into compartments for each variety of product by metal plates. Replenishment stock is carried below baskets. Cabinets come with or without a display superstructure for listing and pricing products. All cabinets are equipped with an automatic warning signal which flashes red when the temperature rises above zero. Cabinets are made for remote installation or for self contained refrigerating unit.





Frozen food cabinet by Frosted Cabinets, Inc.

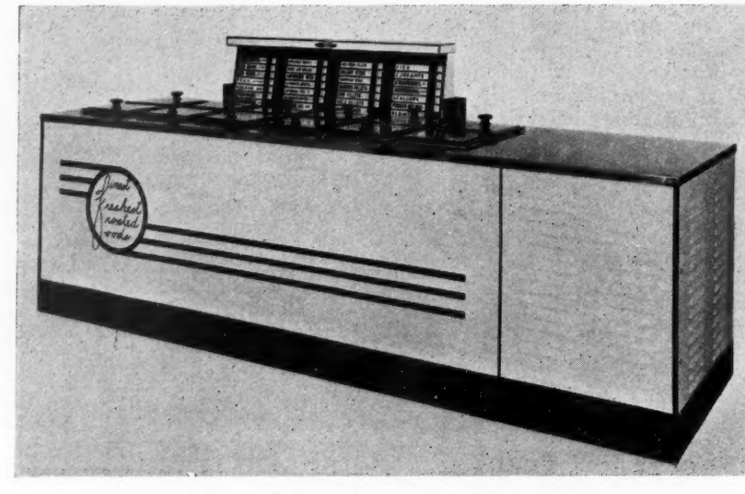
THE C. SCHMIDT CO., John and Livingston Streets, Cincinnati, Ohio

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
4-DL	59⅜" L. 30⅞" W. 33⅝" H.	16.25	1000	.....	....	.....	.....	.....	.....	.....	Metal	Stainless steel top porcelain sides and ends	Cork	4"	Lift lid	No	No
6-DL	83⅞" L. 30⅞" W. 33⅝" H.	24.02	1400	.....	....	.....	.....	.....	.....	.....	Metal	Stainless steel top porcelain sides and ends	Cork	4"	Lift lid	No	No
4-DLSC	83⅜" L. 30⅞" W. 33⅝" H.	16.25	1200	−5 to +5	Yes	Direct expansion	Methyl chloride	Plate	¼	.....	Metal	Stainless steel top porcelain sides and ends	Cork	4"	Lift lid	No	No
6-DLSC	107⅛" L. 30⅞" W. 33⅝" H.	24.02	1675	−5 to +5	Yes	Direct expansion	Methyl chloride	Plate	⅓	.....	Metal	Stainless steel top porcelain sides and ends	Cork	4"	Lift lid	No	No

C. Schmidt Co.

THE C. SCHMIDT CO.'s frozen food cabinet is equipped with a stainless steel top and porcelain ends and sides. Access to the frozen foods is through hinged lift lids on the top of the cabinet. Some models are equipped with a storage compartment in the bottom, access to which is through doors in the rear of the cabinet. In this compartment, sliding drawers are provided for storage of frozen foods.

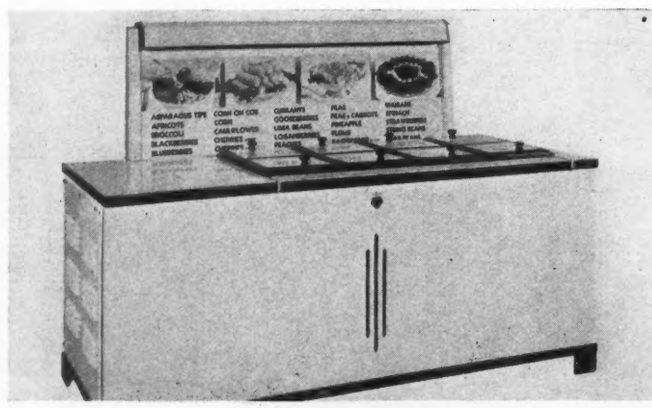


Frozen food cabinet by C. Schmidt Co.

HAROLD L. SCHAEFER, INC., 1629 Hennepin Avenue, Minneapolis, Minnesota

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
8-DPS	75¼" L 31" W 50" H	12.68	839	−20° to 45°	Yes	Direct expansion	CH_3Cl F_{12} SO_2	Hermetically sealed coils in walls	⅓	Approx. 3.5	Steel	High baked Dulux on Bonderized steel	.....	3½" walls, 4" bottom	Top lid type	No	No
8-DPT	75¼" L 31" W 50" H	12.68	839	−20° to 45°	Yes	Direct expansion	CH_3Cl F_{12} SO_2	Hermetically sealed coils in walls	⅓	Approx. 3.5	Steel		.....	3½" walls, 4" bottom	Top lid type	No	No
12-DPS	99" L 31" W 50" H	19.03	1085	−20° to 45°	Yes	Direct expansion	CH_3Cl F_{12} SO_2	Hermetically sealed coils in walls	⅓	Approx. 3.5	Steel		.....	3½" walls, 4" bottom	Top lid type	No	No
12-DPT	99" L 31" W 50" H	19.03	1085	−20° to 45°	Yes	Direct expansion	CH_3Cl F_{12} SO_2	Hermetically sealed coils in walls	⅓	Approx. 3.5	Steel		.....	3½" walls, 4" bottom	Top lid type	No	No



Frozen food cabinet by Harold L. Schaefer, Inc.

Harold L. Schaefer, Inc.

THE SCHAEFER COMPANY manufactures four frozen food cabinets for the retail trade, varying in storage capacity from 12½ to 19 cu. ft. These may be operated at a temperature as low as −20 deg. F. Access to the cabinet is through the top via hinged doors. Frozen food packages are contained in individual lift-out compartments. These cabinets are equipped with lighted advertising display space and also with space for listing and pricing frozen foods.

OTTENHEIMER BROS., INC., 1001-45 N. Montford Avenue, Baltimore, Maryland

DESIGNED FOR USE IN RETAIL STORES

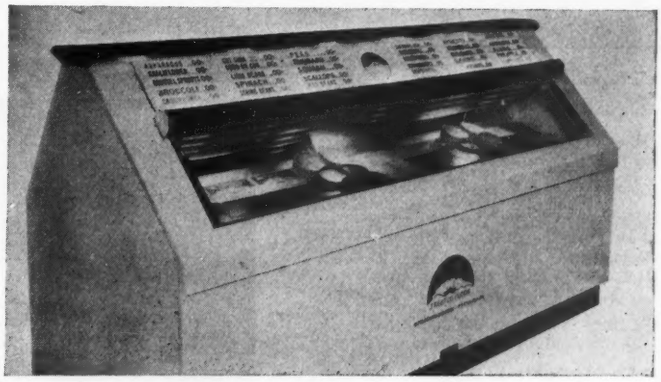
Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
869	86" L 35" W 46½" H	Approx. 550 to 700 (lbs. of food)	Crated, 1400 lbs. No unit	0 to 10°	Yes	Direct	Any light gas	Nest coil	½	.....	Metal and wood	Porcello	Laminated fibrocel	4½" wall	Double acting doors	Yes	2
Remote 509	50" L 35" W 46½" H	Approx. 325–400 (lbs. of food)	Crated 850 lbs. No unit	0 to 10°	Yes	Direct expansion	Any light gas	Nest coil	⅓	.....	Metal and wood	Porcello	Laminated fibrocel	4½" wall	Double acting doors	Yes	2
Self contained 509-A	50" L 35" W 46½" H	Approx. 325–400 (lbs. of food)	Crated 850 lbs. No unit	0 to 10°	Yes	Direct expansion	Any light gas	Nest coil	⅓	.....	Metal and wood	Porcello	Laminated fibrocel	4½" wall	Double acting doors	Yes	

DESIGNED ESPECIALLY FOR INSTITUTIONAL USE

SC 78	76" L 36" W 36" H	Approx. 725 (lbs. of food)	.....	0 to 10°	Yes	Direct expansion	Any light gas	Nest coil	½	.....	Metal and wood	Porcello	Laminated fibrocel	4" wall	Lift-up doors no drawers	No	No
SC 50	50" L 36" W 36" H	Approx. 525 (lbs. of food)	.....	0 to 10°	Yes	Direct expansion	Any light gas	Nest coil	⅓	.....	Metal and wood	Porcello	Laminated fibrocel	4" wall			
SC 40	40" L 36" W 36" H	Approx. 360 (lbs. of food)	.....	0 to 10°	Yes	Direct expansion	Any light gas	Nest coil	⅓	.....	Metal and wood	Porcello	Laminated fibrocel	4" wall		No	No

Ottenheimer Bros., Inc.

OTTENHEIMER BROS. manufactures six frozen food cabinets, three for the retail trade and three for the institutional trade. Storage capacity of the retail cabinets varies from 325 lb. to 700 lb. of frozen packaged food. "Oriole" cabinets for the retail trade are designed for visible display of the frozen products. These cabinets are equipped with space above the display lighting on which to list and price frozen food products.



SHERER-GILLETT CO., Marshall, Michigan

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt-Hours (Average Consumption per 24 Hours)	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door or Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
Hi-Lo	84" L. 36" W. 72" H.	14	.....	0°F. and lower	Yes	.....	.....	Plate coils	.....	.....	.....	Porcelain	Rock cork	4"	6 storage drawers	....	....
Hi-Lo	120" L. 36" W. 72" H.	20	.....	0°F. and lower	Yes	.....	.....	Plate coils	.....	.....	.....	Porcelain	Rock cork	4"	6 storage drawers	....	....
Hi-Lo	144" L. 36" W. 72" H.	24	.....	0°F. and lower	Yes	.....	.....	Plate coils	.....	.....	.....	Porcelain	Rork cork	4"	6 storage drawers	....	....

Frozen food cabinet by Sherer-Gillett Co.

Sherer-Gillett Co.

THE "HI-LO" frozen food cabinet of Sherer-Gillett Co. is a combination case for both fresh and frozen foods. In the lower portion of the cabinet-case are compartments for frozen food storage. The upper portion is arranged for refrigerated display of fresh fruits and vegetables or dairy products. In each of the frozen food storage compartments are two storage drawers. The outside of the cabinet and inside of the fresh goods compartment is finished in white porcelain. Compartments may be operated by separate refrigeration installations or by the same one, as desired.

THE BASTIAN BLESSING CO., 240 East Ontario Street, Chicago, Illinois

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
88	56¾" L 31⅝" W 32¾" H	15	920	−5° F. to 5° F.	Yes	Direct expansion	Freon or methyl	Coil	⅓	4	Steel	Porcelain	Cork	4"	.....	....	....
812	80" L 31⅝" W 32¾" H	21	1245	−5° F. to 5° F.	Yes	Direct expansion	Freon or methyl	Coil	⅓	6	Steel	Porcelain	Cork	4"	.....	....	....
F-042-M	57¼" L 31¼" W 30⅝" H	15	910	−5° F. to 5° F.	Yes	Direct expansion	Freon or methyl	Coil	⅓	4	Steel	Porcelain	Cork	4"	.....	....	....
F-062-M	81¼" L 31¼" W 30⅝" H	21	1180	−5° F. to 5° F.	Yes	Direct expansion	Freon or methyl	Coil	⅓	6	Steel	Porcelain	Cork	4"	.....	....	....
DESIGNED ESPECIALLY FOR INSTITUTIONAL USE																	
400	80⅛" L 32⅞" W 33⅛" H	19	950	−5° F. to 5° F.	Yes	Brine	Freon or methyl	Coil	½	6	Wood	Painted wood	Cork	4"	.....	....	....
600	114¾" L 32⅛" W 33⅛" H	29	1300	−5° F. to 5° F.	Yes	Brine	Freon or methyl	Coil	¾	8	Wood	Painted wood	Cork	4"	.....	....	....
800	149⅜" L 32⅛" W 33⅛" H	39	1850	−5° F. to 5° F.	Yes	Brine	Freon or methyl	Coil	1	10	Wood	Painted wood	Cork	4"	.....	....	....

The Bastian-Blessing Co.

BASTIAN-BLESSING Co. manufactures four frozen food cabinets for the retail trade, three for the institutional trade. The retail cabinets range in capacity from 15 to 21 cu.ft., the institutional cabinets range from 19 to 29 cu.ft. All maintain a temperature of between −5 deg. F. and +5 deg. F. These cabinets are made with contained compressors or with remote compressors. Access is had to the cabinet through full-opening lift covers constructed of semi-hard rubber. All cabinets are equipped with a red-light warning which flashes when the refrigerator fails. A lighted display space for advertising and listing frozen foods and prices comes as a part of the cabinet.

Frozen food cabinet by The Bastian-Blessing Co.

WINNER MANUFACTURING CO., 623 Prospect Street, Trenton, New Jersey

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
1A	45" L. 29" W. 30" H.	6	150	−30°F.	Icefin control	Solid CO_2	.....	Icefin plate	.....	.....	Metal	Enamel or porcelain enamel	Kapoc	4½" walls 5" bottom ½" homosote	Hole type	....	....
1B	54" L. 29" W. 30" H.	8	165	−30°F.	Icefin control	Solid CO_2	.....	Icefin plate	.....	.....	Metal	Enamel or porcelain enamel	Kapoc	4½" walls 5" bottom ½" homosote	Hole type	....	....
2	40" diameter 32" H.	8	300	−30°F.	Icefin control	Solid CO_2	.....	Icefin plate	.....	.....	Metal	Enamel or porcelain enamel	Kapoc	5" walls and top 5½" balsa wood bottom	Hole type	....	....

Winner Manufacturing Co.

THE WINNER MANUFACTURING Co.'s frozen food cabinets ar erefrigerated by solid carbon dioxide with an "Icefin" automatic temperature control. These metal constructed cabinets are finished in either porcelain or enamel. Access to the frozen food storage compartment is through the top of the cabinet.

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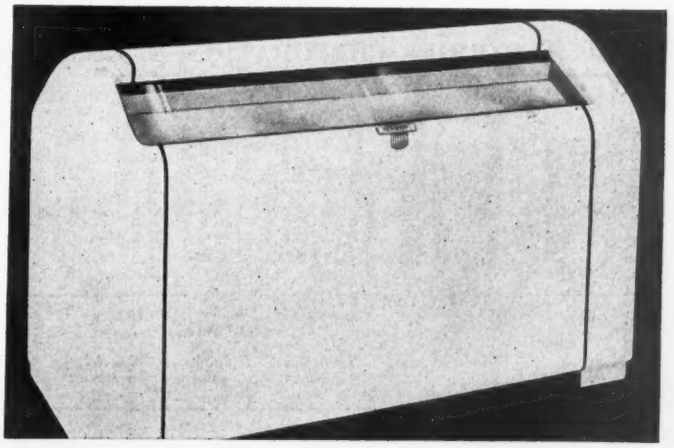
WEBER SHOWCASE AND FIXTURE CO., INC., 5700 Avalon Boulevard, Los Angeles, California

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
8340	72" L. 32" W. 43" H.	18.3	Without unit 1050 With ¼ unit 1200 With ⅓ unit 1380	−5°F. and up	Yes	Direct expansion	Methyl chloride or freon	Plate	¼ or ⅓	.....	Wood and meta	Porcelain	Sheet cork	4"	No	Yes	4

Weber Showcase & Fixture Co., Inc.

THE WEBER FROZEN FOOD CABINET, which has a frozen food capacity of 18.3 cu.ft., will maintain a temperature as low as −5 deg. F. This cabinet is equipped for lighted visual display of frozen food products, having five thicknesses of plate glass and four dead air spaces. Access to the food storage compartment is through square, double-hinged, soda fountain type doors constructed of vulcanized rubber with stainless steel top and bottom. Edges of door are of live rubber, as are the handles. Door frames are also of vulcanized rubber. The storage compartment is equipped with adjustable and removable divisions.



Frozen food cabinet by Weber Showcase & Fixture Co., Inc.

INDIANAPOLIS STORE FIXTURE CO., 327–329 West Washington Street, Indianapolis, Indiana

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
Zero Matic	42" L. 34" W. 38" H.	25	1100	10°–50°	Yes	Coils in eutectic solution	Methyl chloride or F-12	Coils	.....	.....	.....	Porcelain	Cork	4"	Hinged doors	Yes	3
Drice-O°-Matic	52½" L. 34½" W. 56" H.	.....	1250	Low as desired	....	Solid CO_2	Solid CO_2 in calcium chloride	.....	.....	.....	.....	White lacquer	.....	.....	.....	No	No

Indianapolis Store Fixture

THE INDIANAPOLIS STORE FIXTURE COMPANY makes two frozen food cabinets; one, mechanically refrigerated, the other refrigerated by solid carbon dioxide. The "Zero-Matic", a mechanically refrigerated cabinet, is designed for visible display of frozen products in a compartment behind glass with three dead air space insulation. The cabinet refrigerated by solid carbon dioxide is equipped with two frozen food compartments, one for servicing and the other for storage. Front, sides and back of both cabinets are of white porcelain.

SUPER-COLD CORP., LTD., 1020 East 59th Street, Los Angeles, California

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
1100	96" L 35" W 54" H	Display 14 ft., Storage 25 ft.	Approx. 1800	0° F.+	Yes	Direct expansion	Methyl chloride	Cold plate	¾ h.p.	8	Wood and metal	Porcelain on metal	Celotex	4"	Hard rubber doors	Yes	3

Super-Cold Corp., Ltd.

SUPER-COLD CORP.'s Model No. 1100 is designed for visual inspection of frozen products through a window in the front with three dead air insulating spaces. The display compartment has a capacity of 14 cu.ft., the storage compartment, a capacity of 25 cu.ft. Access to the compartments of this porcelain finished cabinet is through hard-rubber doors in the back side.

FROSTED FOOD PRODUCTS CO., 19 East 47th Street, New York City

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt-Hours (Average Consumption per 24 Hours)	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
B jr.	53″ L. 30″ W. 32″ H.	7	230	down to −6°F.	Yes	Direct expansion	Freon	Continuous coil	¼	3 to 4	Metal	Porcelain top, enamel sides	Pine cork	4″ sides 5″ bottom	Hinged lids	No	No
B reg.	65″ L. 30″ W. 32″ H.	10	280	down to −6°F.	Yes	Direct expansion	Freon	Continuous coil	⅓	3 to 4	Metal	Porcelain top, enamel sides	Pine cork	4″ sides 5″ bottom	Hinged lids	No	No

Frosted Food Products Co.

FROSTED FOOD PRODUCTS CO. manufactures two mechanically refrigerated frozen food cabinets. These cabinets are of metal construction, porcelain finished outside and enamel finished inside. Access to food storage compartments is from the top through hinged lids.

CARRIER CORPORATION, S. Geddes Street, Syracuse, New York

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
CFF8	80⅞″ L. 31¾″ W. 30⅝″ H.	250 (lbs. of food)	1100	−5 to 0°	Yes	Direct expansion	Methyl chloride	Coil back of plate	¼	2½	Metal	Porcelain	Corkboard	4″	"Trayveyor"	No	No
CFF12	104½″ L. 31¾″ W. 30⅝″ H.	400 (lbs. of food)	1375	−5 to 0°	Yes	Direct expansion	Methyl chloride	Coil back of plate	⅓	3	Metal	Porcelain	Corkboard	4″	"Trayveyor"	No	No

Carrier Corporation

CARRIER MANUFACTURES two frozen food cabinets with frozen food capacities varying from 250 to 400 lb. Access to the cabinet of welded steel construction is from the top through hinged doors to the "Trayveyor" type of drawers which slide on rollers to permit access to the lower layers of stored frozen foods. These cabinets are equipped with lighted display boards for advertising and listings of frozen foods and prices.

CRUSE REFRIGERATOR CO., INC., 1010–18 E. Broadway, Louisville, Kentucky

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control?	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
Storage	72″ L. 36″ W. 36″ H.	25	1300	−20° to 0	Yes	Direct expansion	Freon and methyl	Plate coils	¼	.....	Wood	Porcelain	Corkboard	4″	.....	Yes	3
Display	72″ L. 36″ W. 48″ H.	30	1600	−20° to 0	No	Direct expansion	Freon and methyl	Plate coils	⅓	.....	Metal	Porcelain	Corkboard	6″	.....	Yes	3

Cruse Refrigerator Co.

CRUSE manufactures three frozen food display cases with storage capacities from 25 to 30 cu.ft. operating at temperatures from 0 to −20 deg. F. Each of these cabinets is equipped with visual display of the packaged frozen food products through a window with three dead air spaces.

UNIVERSAL COOLER CORP., Green and Melville, Detroit, Michigan

DESIGNED FOR USE IN RETAIL STORES

Model	Dimensions (Length, Width and Height)	Capacity (Cubic Feet)	Shipping Weight	Temperature Range (Lowest to highest attainable)	Automatic Temperature Control	Type of Refrigeration (Direct Expansion, Brine, Solid CO_2)	Refrigerant (Sulphur Dioxide, Ammonia, etc.)	Type of Cooling Surface (Fin, Coil, Plate, etc.)	Horsepower of Motor	Kilowatt Consumption Per Hour	Construction of Cabinet (Wood, Metal)	Finish of Cabinet (Enamel, Porcelain)	Type of Insulation	Thickness of Insulation	Door on Drawer Type of Cabinet	Visible Display (Yes or No)	How Many Dead-air Spaces in Windows?
25 Fl-iar	171½″ L. 93¼″ W. 26″ H.	5¾	450	5° to −30°F.	Yes	Direct expansion	Freon-12	Fin	¼	.....	Steel	Enamel	.....	.....	No	No	No
33 Fl-iar DD	171½″ L. 93¼″ W. 26″ H.	5¾	465	5° to −30°F.	Yes	Direct expansion	Freon-12	Fin	⅓	.....	Steel	Enamel	.....	.....	No	No	No
33-Fl-iar FF	171½″ L. 93¼″ W. 26″ H.	5¾	475	5° to −30°F.	Yes	Direct expansion	Freon-12	Fin	⅓	.....	Steel	Enamel	.....	.....	No	No	No

UNIVERSAL COOLER CORP.'s frozen food cabinets are built to specifications and are equipped with the company's own refrigerating unit.